THE MARINE REVIEW

VOL. 43 CLEVELAND MARCH, 1913 NEW YORK No. 3

New Dry Dock at Manitowoc

It Has a Lifting Capacity of 6,000 Tons and Will Handle a 500 Ft. Vessel

MANITOWOC harbor has recently been improved by the construction of a new sectional steel floating dry dock capable of taking boats of the largest capacity, although it is not designed to handle the few ore boats on the Great Lakes of the 600-ft. type. It is one of the largest docks on Lake Michigan and will take on boats that heretofore had to go east of the St. Clair river for dockage facilities. The dock has been built by the Manitowoc Ship Building & Dry Dock Co. and its construction was made necessary by the great increase in shipping on Lake Michigan in the past few years. It was constructed in eight sections and has an overall length of 480 ft. and a width of 70 ft. between the wings on the keel blocks. It will take a ship with 16-ft. draught and has a total lifting capacity of 6,000 net tons dead weight. It will easily handle a steamer 504 ft. in length between perpendiculars. It is thoroughly protected from storms by a landlocked harbor and is conveniently located alongside the works of the Manitowoc Ship Building & Dry Dock Co. and the Manitowoc Boiler Works Co., which have special facilities for executing hull, machinery and boiler repairs of all kinds. The dock itself is equipped with electric lights for night work, with pneumatic tools, ox-hydrogen cutting torches and other special tools.

A general view of the new dock with the steamer Brazil on the keel blocks is shown in Fig. 1. Fig. 2 is a half section through one of the pontoons and wings and indicates clearly the framing and general method of construction. As indicated in Fig. 1, the second and fifth section is made with a large hatch through the wings, permitting easy access to the floor of the dock.

The sections are independent of one another and were built and

FIG. 1—GENERAL VIEW OF NEW MANITOWOC DRY DOCK

Generated on 2024-07-25 21:52 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

ing clear around the inside of the dock from the top of one wing across the floor to the top of the opposite wing. A similar row of bolts also runs down the outside of each wing. Across the bottom there are six 5-in. bolts equidistantly spaced; they are accessible from the inside of the pontoons and pass through watertight stuffing boxes. This system of connections unites the sections into one compact unit. The design, however, is such that no great strain comes on the bolts at any time, since each section takes care of its own load and acts independently of its neighbors, hydraulically as well as mechanically.

The pontoons have a molded depth high inside, from the floor of the dock, and the side walls are therefore 28 ft. in height from the upper deck to the turn of the bilge. The wings are 6 ft. wide on top and 9 ft. at the bottom; the dock is therefore 76 ft. wide inside on top and 70 ft. wide at the keel blocks. There are three watertight fore-and-aft bulkheads in each section, located as indicated in Fig. 2 and also one transverse bulkhead, thus dividing each section into eight watertight compartments.

The general features of the framing and plating are clearly indicated in Fig. 2. The transverse framing of the pontoons consists of 5 x 3-in., 9.8-lb. double angles; the main frames in the

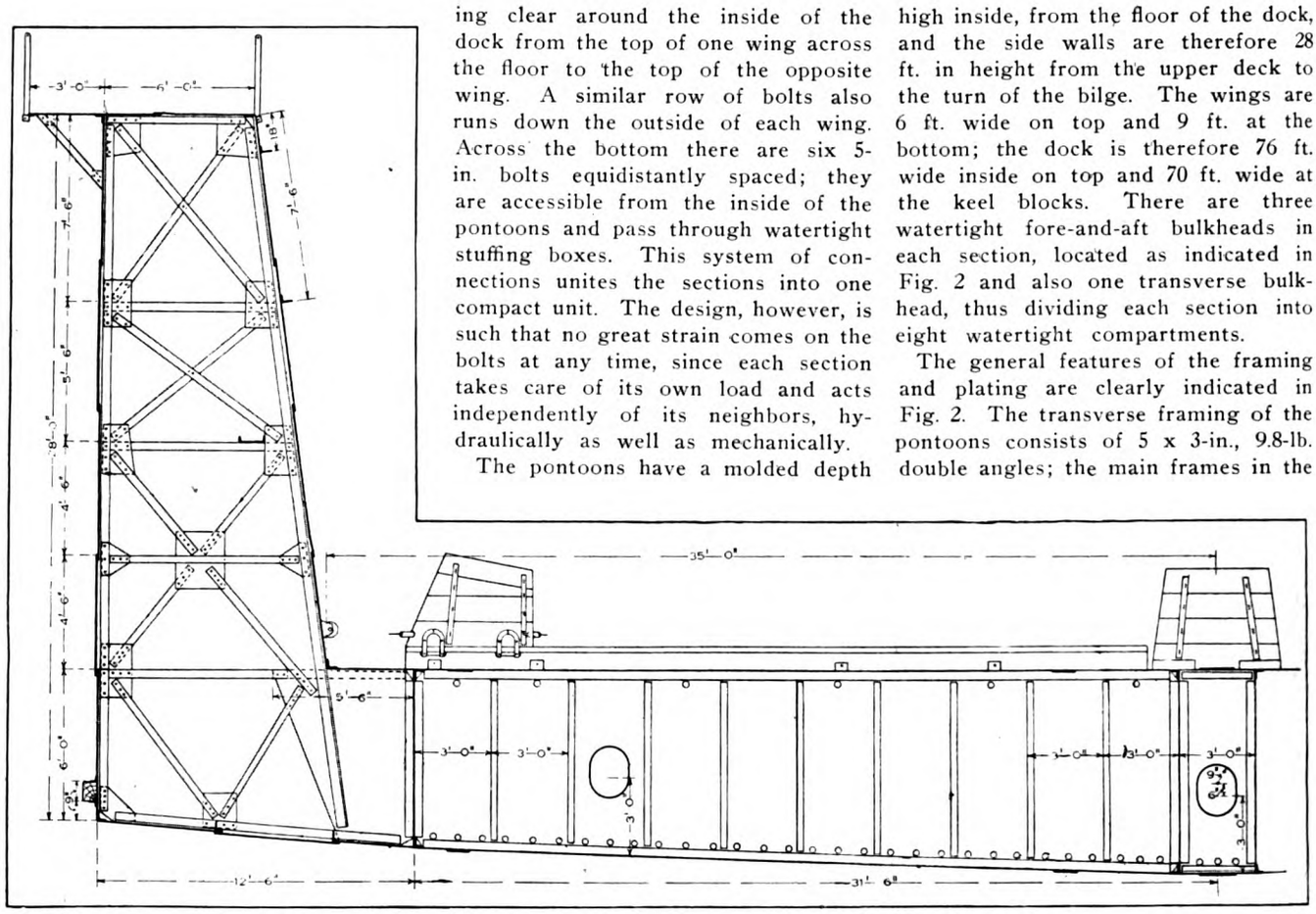


FIG. 2—HALF SECTION OF DOCK IN WAY OF BULKHEAD

launched separately. They are held together by a belt of 1¼-in. bolts spaced 6-in. center to center extend-

of 8 ft. at the center and 6 ft. at the sides; they are each 60 ft. long and 88 ft. beam. The wings are 22 ft.

wings are 5 x 3-in., 9.8-lb. angles tied together with a lattice work or truss built of 4 x 3-in., 7.2-lb. and 8.5-lb.

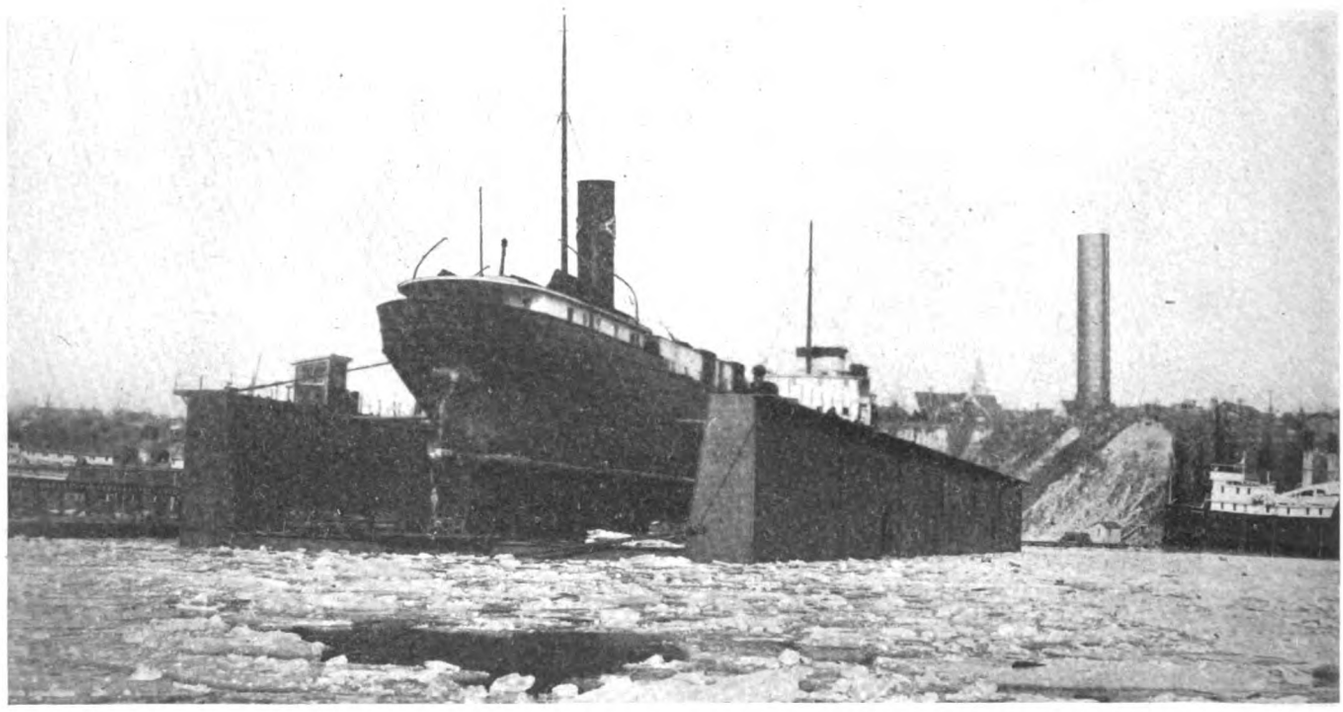


FIG. 3—END VIEW OF MANITOWOC DRY DOCK

Generated on 2024-07-25 21:52 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

angles. The bottom inside and out and also the first two courses on the outside of the wings are sheathed with 15-lb. steel plates; the remainder of the plating is 12.5-lb. except the outside upper course on the wings which is 9.8-lb. The bulkheads are double 15-lb. plates stiffened by 3 x 4-in., 7.2-lb. vertical angles spaced 3 ft. apart. The bilge of the dock is protected by a 6 x 9-in. oak wearing strip. There is a 3-ft. overhanging walk at the top of the wings; this makes a 9-ft. passageway along the top of the dock protected by a steel railing on both sides.

The general design of the keel blocks is shown in Fig. 2. They are of oak of the usual type. A rather novel method of moving them back and forth along the ways has been adopted. Each block is connected to two glavanized chains which lead under sheaves and up the side of the dock to the top of the wings; the blocks are moved simply by hauling at the ends of the chains. The keel blocks are spaced on 5 ft. centers, there being 13 in each section of the dock.

Each section is equipped with an electric-driven turbine pump and the entire dock can be pumped out in about two hours. The details of the pump and motor connections are given in Fig. 4. The pump is at the bottom of the dock and the motor at the top of wings, where it is readily accessible. The two are connected together by a 2-7/16-in. vertical shaft; the shaft is made in two sections, one being 18 ft. 1 in. and the other 5 ft., 7½ in. between couplings. It is carried in three steady bearings located as indicated in Fig. 4. The pump is provided with its own thrust bearing.

The pump is of special design for working at constant efficiency under varying heads and was manufactured by the Rees Roturbo Mfg. Co., Ltd., Wolverhampton, England, the American rights being controlled by the Manistee Iron Works, Manistee, Mich. It is a true turbine pump and has a 12-in. suction and discharge. At 20-ft. head it has a rated capacity of 3,060 gallons per minute; this is increased to 4,220 gallons at 14-ft. head and to 5,080 gallons at 6-ft. head. The foregoing capacities are based on a speed of 950 r. p. m. The load being constant, the pump requires 25 brake horsepower to operate it, and is connected to a 25-horsepower Ft. Wayne 220-volt direct current motor. The pump control valves and motor controller are located in shelter houses at the top of the dock. Two of these may be seen at the right in Fig. 1. Each section is provided with a junction box where connection is made with the main transmission line leading to the power house. The pumps are operated independently of one another, each one pumping out its own section of the dock. When in operation there is a man in each pumphouse working under the direction of the dock superintendent.

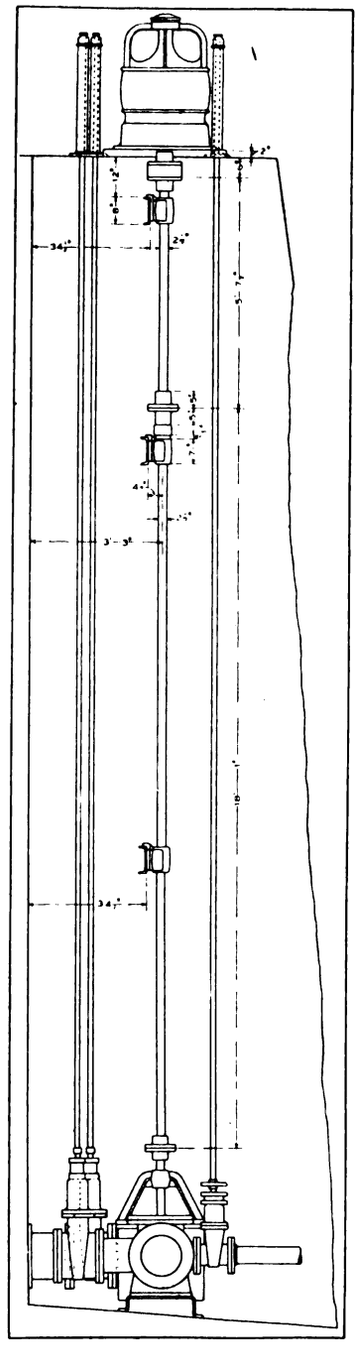


FIG. 4—PUMP CONNECTIONS

Charles W. Cook, purchasing agent for the Crosby Transportation Co., Milwaukee, has invented an improved life raft consisting of a series of air-tight galvanized iron tanks bound together in framework. Mr. Cook has demonstrated a working model to the local inspectors of steam vessels at Milwaukee.

The Sperry Gyroscope Co., of New York, has been awarded contract by the navy department for eight gyroscopic battleship compasses at a cost of $10,000 each.

The Heyl-Patterson Construction Co. has given contract to build a $150,000 addition to the Northwestern Fuel Co.'s dock No. 1 at Superior.

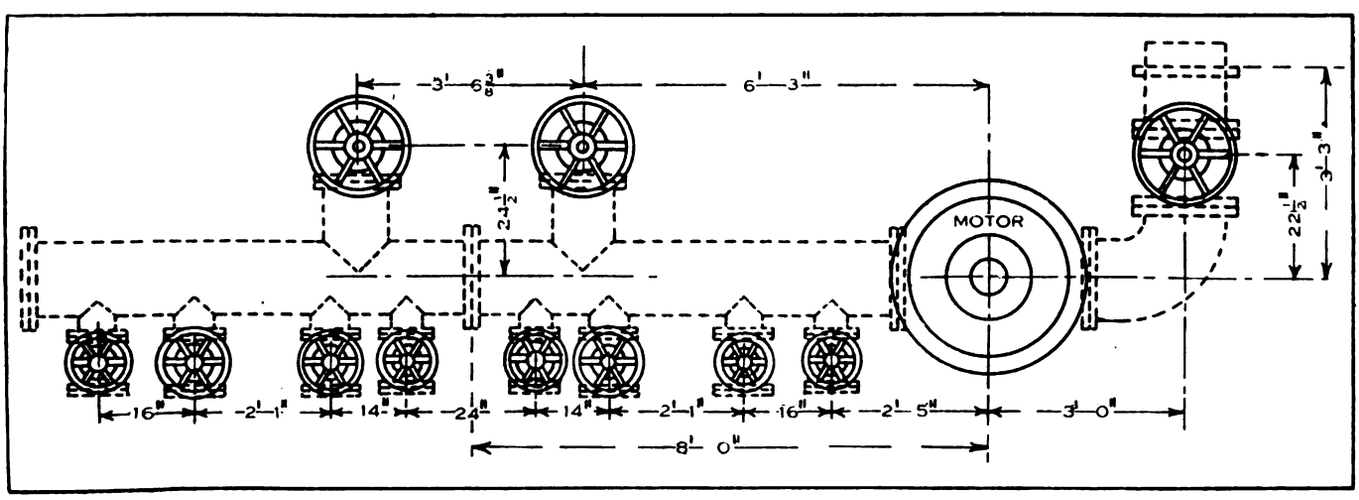


FIG. 5—PLAN OF SUCTION MANIFOLD

Generated on 2024-07-25 21:52 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

Active Stabilizing Gyro

In Which Elmer A. Sperry Replies to the Discussion Which His Paper Called Forth

ELMER A. Sperry's paper on the subject "Active Type of Stabilizing Gyro" was published in the January MARINE REVIEW and has attracted considerable attention. Since the reading of the paper before the Society of Naval Architects and Marine Engineers and its subsequent publication, new discussion has been submitted upon it by the members and is herewith published.

Maxwell W. Day:—In paragraph (c) on page 2 of the advance copy, Mr. Sperry has stated that the use of the gyroscope saves power in propelling the vessel on account of the elimination of rolling. It would be interesting to know how much less power is required to propel a vessel in rough water when it is maintained steady by the gyroscope than when it is allowed to roll freely. Also, he mentions the longer period of the roll of the vessel when steaming, as compared with the period when not under way. It would be interesting to know how much longer this period is and what is the reason for it.

Carl L. Norden:—I have read with great interest Mr. Sperry's paper on a subject to which I have given much time. I have also read the discussion of Rudolf Blohm. I beg to add a few words regarding the new stabilizer and its quite remarkable performance.

First, with regard to Mr. Blohm's conclusion, "that any anti-rolling must be designed for the case of resonance". This may be based on the assumption that such a device is only required to reduce excessive rolling, which, as we all know, happens when a vessel receives a series of strong impulses somewhat in phase with its own natural period. Mr. Sperry's conception of true stabilization is an entirely different one. With Sir Thornycroft, he believes, on the contrary, that a stabilizer should exert upon the ship at all times and up to its rated capacity moments that are equal and opposite to those due to any wave impulse or any outside disturbing cause. Although the mass moment of the ship is useful in the evening-up small differences between the acting moments, he proposes to deal in principal with each impulse separately.

Suppose a vessel is kept very close to its natural upright position, say within a degree or so; it is evident that its momentary angular velocity, respecting its variation, will be the result of the algebraic sum of all the moments, including the ship's small righting moment, that act upon it. Now if an active stabilizer, for instance Mr. Sperry's gyro, is precessed with positive control in such a way that this angular velocity of roll remains practically zero, the ship will be held within very small angles; these angles will, in fact, by only such as are necessitated by the particular type of control employed, and this condition is easily maintained up to the maximum capacity of the stabilizer as against any wave impulse.

Its Unique Operation

To illustrate further the unique operation of Mr. Sperry's stabilizer, it would be as though we were to effect stabilization by a non-pendulous gyro of the passive type, but possessed of no precession inertia; no suspension friction; in a word, practically nascent, yet with its full stabilizing and centering instinct, exerting stabilizing couples precisely as required. One of the most interesting and significant points in this connection is that under these conditions there is practically no work done by the ship upon the gyro or by the gyro upon the ship because of there being practically no angular velocity present. It is this fact, taken together with its incessant operation, working, as Mr. Sperry states, much more often than the half-period of the ship, that accounts for the smallness of the plant required.

Much time has been directed to arriving at the efficiency of these stabilizers. Starting with a theorem laid down by Naval Constructor David W. Taylor, U. S. N., it has been determined that the efficiency of the stabilizer operating as described above is very close to 100 per cent.

Should some individual wave moment attack the ship which is of a magnitude above the capacity of the stabilizing plant, its specific quenching efficiency still remains very high, because:

(1) Its roll quenching impulses are always given when the ship's small angular velocity is approximately at its maximum, thus avoiding the inefficient part of the cycle of a pendulous stabilizer, even when in phase with both the ship and sea. It is known that the pendulous stabilizer could never exceed about 70 per cent efficiency and usually much less, because in practice it could never rise to

$$\int_0^{\pi} \sin^2 a\,da$$

Its moments are *always* applied with a maximum efficiency in the right direction, and perfectly in phase with the ship in a mixed sea. A pendulous stabilizer does not satisfy any part of this requirement.

(3) The cycle of wave impulses such as is shown in the first figures of this paper affords really two points in each cycle at which the stabilizer will always bring the ship upright so that each new set of wave impulses between these points will always be met by the maximum mass moment against rolling. Whereas a stabilizer based on resonance and itself possessing very large inertia will keep on rolling the ship.

The inertia of a pendulous damping mass can be destroyed quickly enough, but this should always be done at such a rate as to maintain its period and its mass must then be re-energized by the ship at the cost of further rolling.

Typical Roll Record

If we consider a typical roll record, taken when the ship approximates periodic resonance with the waves, we observe that the rolling is made up of individual groups. The more regular the sea, and the more the apparent wave period equals the period of the vessel, the greater the number of individual rolls constituting a group, and, to a certain extent, the greater the amplitude of unrestricted rolling reached. To ascertain the magnitude and character of the wave impulses a given stabilizer would have to deal with in keeping the ship upright, one has to augment the angles of roll recorded by the friction-damping-angles for each single roll. The latter angles are available from a natural dying-down record, taken at the same steaming speed, and will be found surprisingly large where higher speeds and effective bilge keels are present. It will then be observed that each group represents two sets of wave impulses with some small impulses between them where the ship is completely out of phase with the waves.

Generated on 2024-07-25 21:53 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

The new non-resonance type of stabilizer of Mr. Sperry's is always in perfect tune with any impulse and is found to enjoy twice as many "breathing spells", as would seem apparent from the roll diagram, whereas a resonance device in the same sea will find between the decreasing and increasing portions of the record a lapse in phase between the sea and the ship, causing the pendulous mass to either give not enough or too much counter moment, often actually producing roll. Its low specific quenching capacity is, therefore, the very result of the resonance principle employed and due to the fact that only during an occasional roll increment it develops moments that are in phase with and of the same magnitude as those received from the sea.

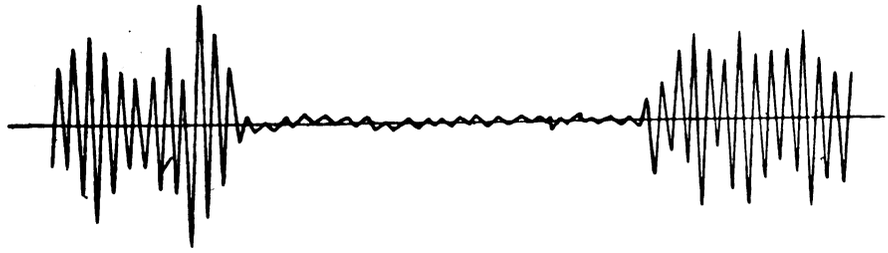


Figure No 20
Gyroscopic Stabilization

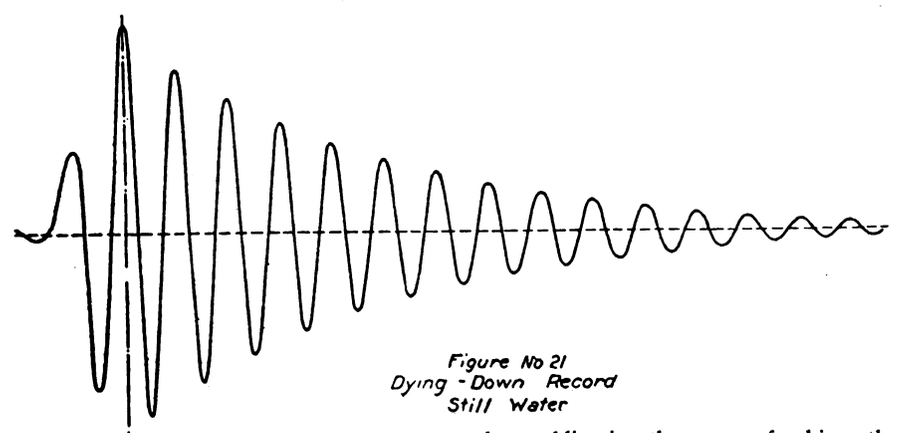


Figure No 21
Dying-Down Record
Still Water

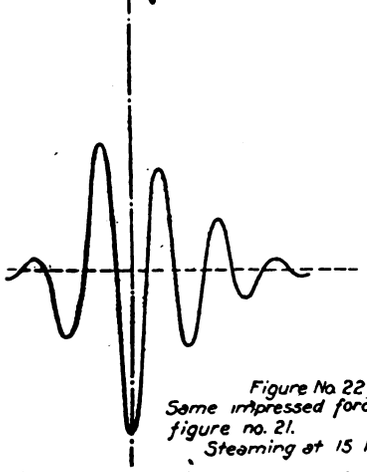


Figure No. 22
Same impressed forces as in figure no. 21.
Steaming at 15 knots.

Excellent Missionary Work

Elmer A. Sperry:—Replying to the discussion by Rudolf Blohm, I wish to congratulate both Mr. Frahm and Messrs. Blohm & Voss, who are the owners of the Frahm damping tanks, upon the favor with which their installations have been received. I look upon this effort to damp out part of the rolling of ships, even reducing it to 33 per cent, as Mr. Blohm states at one point in his discussion, as being in the right direction. I believe that our German contemporaries are doing excellent missionary work in educating the public in the use of ships that roll much less than heretofore and toward ships that in the future will be entirely free from rolling. The full scale trials that have been prosecuted during the present year have ushered in a new era wherein ships will be entirely free from rolling.

The tanks Mr. Blohm refers to in his discussion are for the purpose of reducing the rolling, or suppressing it in part, whereas the active type of gyroscope described in my paper is for the purpose of completing this good work to the extent of the entire prevention of rolling—instead of dealing with it in part it deals with it in whole.

With the new arrangement, the great longitudinal stability of the ship, which is always present, can be laid hold upon and utilized athwartship to any extent desired, not merely for the reduction and suppression, but for the absolute prevention of rolling, up to and including any wave increment or wave slope impinging the ship. In fact, the active gyro never operates in any other way; the ship never responds to the wave slopes or any of the incessant wave actions; and never rolls until the limit originally determined upon has been exceeded and then the motion amounts to only the small overplus or excess existing in some exceptional wave increment which on the next half oscillation of the gyro is wiped out.

It has been definitely ascertained, as has been well stated by a member of our council, F. L. DuBosque, in his kind words of discussion on this paper, that at last we have in hand "the long sought for device that will prevent the annoying rolling of ships."

Dealing with primary resonance, Mr. Blohm's statement that "as soon as it is proved that the ship always has the same or nearly the same period, the effectiveness of the tanks would not be affected by the absence of the primary resonance between waves and ship," seems to indicate that it is his belief that so long as the ship retains her period the effectiveness of the tanks is unimpared and remains independent of the period of the sea with any given sea intensity.

In answer to this, I would call attention to Figs. 4 to 7, where the tanks which were effective under the four quite widely differing conditions as to intensity of sea when same was synchronous, have, as we see, become practically useless; nothing has changed except the period of the sea or the primary resonance between waves and ship, and this only slightly. Here is a case taken from Frahm's own work, fully corroborated by work on this side, which conforms to Mr. Blohm's requirement that the ship shall retain its period, and yet the tanks have practically gone out of business from no other cause than a slight change in the period of the sea.

Mr. Blohm's statement that the period of a ship varies with change of load from 3.73 to 4.61 indicates a change of approximately 30 per cent, about the same as has been observed upon a tender ship rolling in still water and when steaming.

I am glad Mr. Blohm mentioned the compound pendulum. All who are familiar with this interesting mechanism know how entirely inoperative it is, unless quite exact synchronism is maintained throughout the entire chain of pendulums. Work with this compound pendulum is very instructive and serves to show most emphatically how utterly circumscribed and limited is the usefulness of any device tied down to a single period, especially in preventing motions of mixed periodic origin. The pendulum always responds with perfect freedom to the first impulses; later, often *too* late, the secondary pendulum or pendulums get under motion and oppose, to a certain extent, farther increment in the main pendulum, but

Generated on 2024-07-25 21:53 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

by this time the original impressed force has perhaps changed its period and the secondary pendulum may then actually be found to be increasing the motion instead of decreasing it, as expected. This very phenomenon has been observed at sea with tanks and when repeated in period renders them positively dangerous, as stated in my paper.

The Compound Pendulum

Work with a compound pendulum, especially when truthfully representing as far as possible sea conditions as to original energizing impacts, shows in the most emphatic manner the necessity for breaking away from devices limited to resonance or periodic phenomena. On the contrary, the device to be effective must not be tangled up with some past happening that has excited it, but should be free to grapple and fully deal with each present disturbance and so neutralize it that no motion of the pendulum or ship can result; and then deal with the next, and the next, independent of their direction, time or intensity. If no individual impact is permitted to move the ship, the ship never begins to move and therefore remains motion-free.

Referring again to Figs. 4 to 7. We are informed that these tests extended over several hours. What is more important, we know, as stated above, that they are absolutely representative of the several conditions. We also know that with heavier sea conditions the percentage of departure from synchronism when the tanks fail is smaller than on light seas. Compare this percentage in Fig. 7 with that of the other Figs. on Plate 2. Mr. Blohm mentions that the above facts with regard to heavier seas "are not justified". He also stated that "he (Sperry) has not published any data or curves to prove his words." I ask what further proof is required? If Mr. Blohm considers the performance in, say, Fig. 7, where all the tanks were in full operation as useful stabilization, I for one certainly take issue with him and will add that it has been definitely ascertained that there are sea conditions where the ship is actually obsessed with more total motion with the tanks in operation than when they are out of operation.

It is, of course, understood that the air line is used to render the tanks inactive at will, or when they become dangerous. The difficulty is that the remedy comes too late and a complete closure of the air line locks the water on a listed boat so as to maintain the list. Considerable adjustment and attention would be required to keep the period of the tanks in harmony with that of the vessel, which Mr. Blohm states has been found to vary nearly 30 per cent from different loading and also from changes in period due to different steaming velocities, especially in case of a tender ship, as stated in my paper.

It is also important that our stabilizer shall deal with the most aggravated and mixed seas, because they are almost universal and also because they are most vigorous and most disturbing; probably because such seas are entirely outside the practical scope of tank operation, Mr. Blohm tells us that they are unimportant and with characteristic Teutonic directness and finality we are informed "that any anti-rolling device has to be designed *only* for the case of resonance." The emphasis upon the "*only*" is Mr. Blohm's.

Aggravated and Mixed Seas

Improved and more perfect methods will always prevail. Improved methods are now at hand which I predict will supersede damping tanks, fettered to resonance and period as they are, and also to disturbing the center of gravity of the ship and shifting same through quite wide limits; especially now that the new method, operating without altering the center of gravity to the slightest degree, is known to give superior results in any sea with far less weight and occupying only a portion of the space. This system operates entirely automatically, even when imparting roll to the ship, requiring practically no supervision, not requiring to be especially adjusted as do tanks to the period of the ship, or readjusted as the period changes.

With reference to the discussion by Admiral Fiske, I deem it fortunate that the flagship Florida should have come to this port at the time the ship undergoing trials with the active type of gyro was making tests alongside. It is gratifying that a device so new as this could have been reviewed in detail by such an eminent scientific and naval authority as Admiral Fiske and that he could have witnessed something of its operation and its powers in controlling the ship.

At the time the proposition for trial of this new auxiliary was originally brought before the General Board of the United States Navy, Admiral Fiske was a member of this Board. I wish here to express my appreciation of the liberal and progressive action taken by that board which led to the extended trials of the apparatus.

The admiral's kind words of encouragement are much appreciated.

With reference to Mr. DuBosque's discussion, I wish to say that Mr. DuBosque approached the new apparatus from the standpoint of a man in charge of large and widely diversified shipping interests; he reviewed the device and its performance from the eminently practical viewpoint of whether the mechanism was likely to be useful and available under the conditions of every-day service of commercial shipping; his interest in the device was also from the standpoint of availability for ice breakers in the Great Lakes.

Three Gyroscopic Impulses

I much appreciate the permission of the Navy Department for Mr. DuBosque's inspection of the plant. It must be understood, of course, that he saw the first apparatus of this type ever built. We have learned much from its practical operation, including as it does 160,000 power precessions, and Mr. DuBosque has been good enough to suggest certain simplifications, of which I wish here to make acknowledgment.

In answer to Maxwell W. Day's questions, I have appended one sheet of curves which may be considered as Figs. 20, 21 and 22. Fig. 20 gives a curve of gyroscopic stabilization; the middle section indicates where the gyros were in operation with one form of control; the end sections indicate the sea that was running at the time. In Figs. 21 and 22 the ship was impressed with exactly the same forces, namely three gyroscopic impulses, and then allowed to die down by the form line resistance, the only difference being that in the first the ship was standing still and under no headway, whereas in the second the ship was steaming at 15 knots. Both of these were taken at sea within two minutes of each other. I am not allowed to give any quantitative data at this time, but I may say that the last two records are upon the same scale and will afford, in all probability, sufficient basis for working out approximate answers to Mr. Day's questions.

In Mr. Norden's discussion we are given a number of important facts on the general subject. He brings out the results of his investigations relating to efficiency of stabilizers and shows that the new device leaves very little to be desired on this important point. He also calls attention to a very important and significant feature of this new system of stabilization, viz.: That when the angular velocity of a ship is held down to practically 0, practically 0 work is expended in holding it; in other words, when the ship is held practically free from rolling, it has been found in practice and has been thoroughly demonstrated to require very little power to maintain this con-

Generated on 2024-07-25 21:53 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

dition. This is an original proposition toward which I have been working and was first set forth and discussed by me a number of years ago, and though it may at first sight seem revolutionary, it is nevertheless true, and being true it should work no less than a revolution in our methods of stabilizing ships, and it also emphasizes the fact that there now remains no farther reason why ships should roll at sea.

My acknowledgments are also due to Naval Constructor David W. Taylor and many of his brother officers, who contributed largely to the success of the work; and also to Carl L. Norden, M. E., who has been actively associated on the work as engineer in chagre.

The Chinaman as a Seaman

Their Patience, Perseverance and Faithfulness Make Them Valuable Members of the Crew

By Albert C Coleman

TO MOST people living in the United States, acquaintance and knowledge of the Chinese is limited to the business done with the slant-eyed, silent individual who washes and polishes shirts, or possibly on some slumming expedition at a bowl of "chop suey". As a seaman and mechanic the Chinaman to most of us appears impossible, but a little searching into history shows us that really the Chinaman was easily ahead of even the ancient civilized people of Europe in the useful arts.

At Hong Kong, the great free port that serves China's great city of Canton, there is a ship building and engineering plant in connection with several large dry docks, that employs on an average about 6,000 men. Only the heads of departments are Europeans and all the work, skilled and unskilled, is done by Chinese. Although a large part of the total work done is the repairing of ships, yet the new work executed every year reaches a very large amount. With a hammer as big as the giant at Bethlehem, and a lathe so long that it serves as two machines for ordinary work, when a new ship leaves the works and goes into service, everything on her, from her boilers below, to the cushions on the seats, is the work of Chinese in the different departments of the plant.

Touching the danger that we fear in the competition with the cheap labor of the Orient, there is an interesting lesson to be learned at the lighting plant for Kowloon, located at about one-half mile from the ship yard. When the electric plant was decided on bids to supply the machinery were invited and when the plant was finished, it was found that the generators were from Pittsburgh, the boilers from Chicago, and the engines from New York. This equipment must have been delivered very cheap to beat the cheap labor near-

MR. ALBERT C. COLEMAN.

Albert C. Coleman, the author of this article, is the chief engineer of the steamship Ancon, of the Panama Railroad Steamship Line, running between New York and Colon. He has had a long experience in various parts of the world and spent considerable time in Chinese waters. He began his seafaring career on the great lakes, shipping as fireman on the steamer Wallula, of the Wilson Transit Co.'s fleet. He later sailed on the Marquette, Nyanza and India and was on the Missoula when she was wrecked off Michipicoten island, Lake Superior, in 1895. He went to the coast in 1896, and entered the service of the New York, New Haven & Hartford railroad as oiler. When the war with Spain broke out in 1898 he shipped as oiler on the transport Grant and served also on the Logan, Thomas and Rosecrans, being second engineer of the latter steamer. The Boston Towboat Co. then built the steamers Shawmut, Tremont and Hyades and he was appointed first assistant engineer of the Hyades, running from Tacoma to China. When the Shawmut and Tremont were sold to the Isthmian Canal Commission Mr. Coleman went on the Tremont as first assistant engineer, bringing her around to the Atlantic coast. He was then transferred to the Shawmut as chief engineer, which position he at present holds, the Shawmut having been renamed Ancon by the canal commission.

by with the mechanics at 50 cents a day.

Every line that has a Chinese port for a port of call has taken on Chinese crews for their vessels. Many of the large high powered coasting steamers employ only a captain and chief engineer of European and the rest of the crew of Chinese.

The usual method of getting a Chinese crew in Hong Kong is for the captain or agent to requisition the compradore for a crew, furnishing him with list of the men wanted. Many of the companies in lieu of boarding the men as is usual, allow each man a certain sum per month to board himself. The average amount is around eight dollars silver, which is equal to about four dollars of our money. This money is paid to the leading man of the department, the boatswain of the sailors, and "Number One" fireman of the engine room crew. The food is largely rice, about one and one half to two pounds per day a man. With a small quantity of dried fish or fat pork, and, while in Chinese waters, some extraordinary vegetables that have no counterpart with us, the men get along very well. Each gang usually carry two or three pigs, buying them when small, and feeding and fattening them on the waste from their own and the officers' galley.

With the higher wages paid to European and American seamen, the crew of all vessels is cut down to the lowest possible number that can work the vessel. If they are not exactly undermanned, because they have a man to fill every position to be filled, yet if a man falls sick some of the remainder must work longer hours to do his work and the efficiency of the ship suffers. So with the appearance of the Chinese seaman on shipboard and his rediculously low wages, compared to white men, the average ship-owner generally opens his heart and provides a few extra men. On ships carrying Chinese you generally find the crew numbers twenty-five to fifty per cent over the same class of ship carrying

Generated on 2024-07-25 21:53 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

white men. This leads to the impression that one white seaman is equal to two Chinese. This is not correct, as in every department of ship life, the Chinaman when once initiated into the white man's ways and speed, can perform equal work within equal time with him.

Many stories have been written, many cases reported, of mutiny and insurrection of Chinese seamen against their white officers. The stories have all been told by the suffering white officers, but they didn't tell of the long weeks and months of cruelty meted out by the "Scotch and soda" maddened tyrant upon the uncomplaining Asiatic. Even the worm will turn, and the Chinese seaman will stand nearly as much as the worm before he turns. But if, when he turns upon his persecutor, and vents the pent-up feelings produced by a long voyage of cruelty in savage atrocity, the blame of the whole thing still lies on the head of the white man.

Their patience under trial, their perseverence to finish a job once started, their faithfulness to their superior officer when treated decently by him, their ability to withstand extremes of cold and heat without complaining, their freedom from the curse of drink that unfortunately is the undoing of seamen of all other countries, makes the Mongolian a model and valuable man on shipboard.

Isherwood System of Construction*

In Which the Author Deals With the Shell Plating Expansion

SHELL EXPANSION.—The plan herewith shows the shell plating expanded for the starboard side of the vessel. All the heavy lines excepting fenders show sight edges of the plating and the dotted lines show the interior stiffening; transverses vertically and the longitudinals lengthwise.

Line of Tank at Side

The double dotted lines running along from the stem to No. 20 transverse on H strake, dropping down to G strake at No. 20 and continuing aft on G strake to transverse No. 25, where it takes a drop to the seam of B strake at No. 29, the end of the water bottom aft, is the line of tank at side. This will be seen by reference to the midship section shown in the first article. The keel strake is lettered A and runs from b to the stern post and is riveted to it. This strake is outside and in one width, the port and starboard bottom transverses being riveted to it. The keel plate is 36 in. wide, being 18 in. on each side. The center keelson angles are 4 in. wide and the center keelson plate 3/8 in. thick, which makes a flat part on the keel of 83/8 in. In this vessel a line 5 in. on each side of the vessel from the center is run in and continued from No. 1 to the end of shoe aft, and forward of No. 1 gradually tapered down to 2½ in. at the 2-ft. water line. This line forms the base of the expansion plan and the plating measured around the transverses is set up from this line, which gives the shape of plan. The keel plate strake after taking off 5 in. will leave 13 in. to be drawn parallel to the base line from No. 1 to 31.

There are eight plates forming the keel strake. The first one No. 1 is 25 lbs. per square foot and the balance 27 lbs.

The weight of the plate may be confusing to some, but if it is remembered that ⅛ in. is equal to 5 lbs. the thickness of the plating can be realized. The keel plate No. 1 is 5/8 in. thick. The two after plates on the keel strake when shaped at the furnace will be like a box with the top and ends off. Owing to the heating of these plates to shape them, they are thinner when finished, so that it is necessary to order them midship weight from the mill, to allow for the reduction in thickness, during process of shaping and when they are finished will probably be the same thickness as No. 1. This strake is always made flush at the butts and strapped on the inside.

Two Longitudinal Frames

B strake is an inside strake and runs parallel to the keel seam and base line from transverse No. 2 to the stern post and like the keel plate is riveted to it. There are nine plates on this strake, the four after plates being reduced in thickness from 17.5 to 15.5 lbs.

There are two longitudinal frames on this strake of plating.

C strake is an outside strake and runs parallel to B but does not run the whole length of the vessel; the lower edge runs from No. 2 to 29 and the upper edge from No. 4 to 26 transverses. There are seven plates on this strake, the two after plates being reduced from 17.5 to 15.5 lbs. per square foot. There is one longitudinal frame on this strake of plating.

D strake is still shorter and practically ends the straight of the bottom plating. This strake is inside and the lower edge runs parallel to the base line from No. 4 to 26, the upper edge being shaped to suit the lower edge of the lower bilge strake E. There are six plates on this strake, the after one being reduced in thickness. There are two longitudinals on this strake of plating.

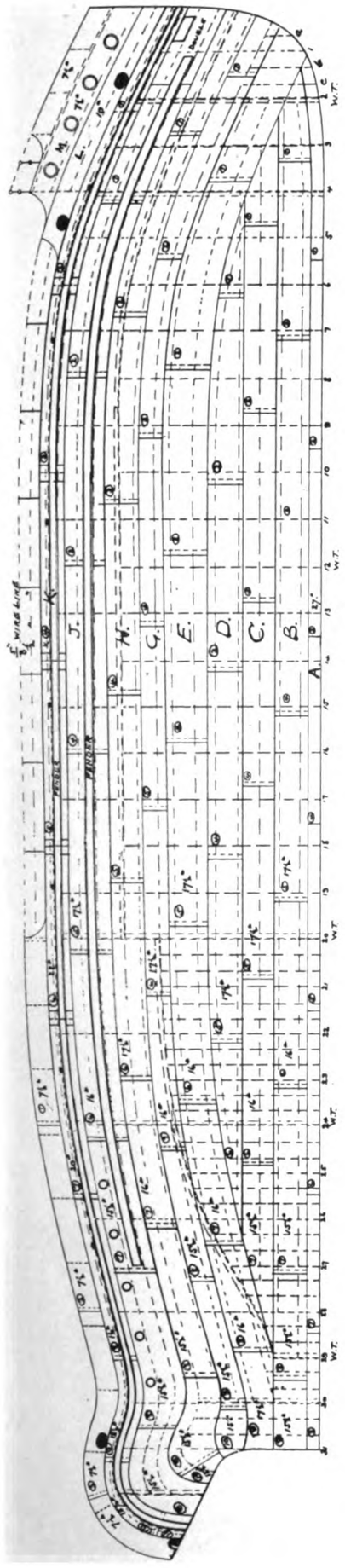
The Tank Side

E strake runs from the stem to the stern post and is riveted to both. The top edge follows the sheer while the bottom edge is parallel to the base line from No. 8 to 21 transverses. This is an outside strake and has nine plates on it, the after one No. 9 covers the boss and for the same reason as the two after keel plates No. 9 is the same thickness as the midship plating; Nos. 6, 7 and 8 are reduced to 16 lbs. The tank side crosses this strake from No. 25 to 29 and all the close spacing of transverses end at this line, the transverses above the tank being 12 ft. apart. There are two longitudinal frames on this strake of plating which run from the fore peak bulkhead to the after peak.

G strake is an inside strake which runs from the stem to the stern post and forms the upper part of the bilge. There are ten plates on this strake, the four after ones being reduced in thickness. There is one longitudinal frame on this strake and the tank side runs across it from No. 20 to 25.

*This is the seventh of a series of articles on the Isherwood System of Construction which began in the September MARINE REVIEW. The first article dealt with the general specifications of the steamer; the second with the sheer, half-breadth and body plans; the third explains the method of getting the sheer; the fourth dealt with the longitudinal and transverse framing; the fifth with offsets and the sixth with the shell plating.

Generated on 2024-07-25 21:53 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY



Both edges of this strake follow the sheer.

H strake is an outside strake and forms a belt around the vessel, both edges being parallel with the sheer. Nine and one-half plates are on each side of the vessel, the tenth plate being on both sides at the after end. The tank side and line of fore peak flat comes on this strake and runs from the stem to bulkhead No. 20. The fore peak is the part from the stem to collision bulkhead No. 2. The boiler room and bunkers take in the space from No. 20 to 24 and the engine room from 24 to 30. The longitudinal on the tank at side line becomes the main deck from No. 24 to the end of vessel. The two longitudinals on this plan, the lower one runs from the stem to the after peak bulkhead while the upper takes in the tank at side and main deck aft. The four after plates are reduced in thickness.

J strake is inside and like the strake below forms a belt around the vessel, both edges being parallel with the sheer. There are nine plates on this strake, the after one being butted on the center line aft. The four after plates are reduced in thickness. The fore end of this strake shows anchor pocket and the plating is doubled around it to resist denting while hauling in the anchor. There are two longitudinal frames as well as a channel fender on this strake.

K is the sheer strake, which is attached to the deck at side and is the most important of all the strakes in appearance when finished. The butts are not overlapped like the others on this strake; they are strapped outside and in having what is termed a double butt strap on each butt amidships. The forward plate is doubled so that the doubling forms a butt strap. From No. 2 to 6 the butts have double straps and from No. 7 to the end the plate butts are overlapped. The eleventh plate on this strake is butted on the side, the body of the plate crossing the center of the vessel at the after end. This strake stands above the deck 9 in. and allows for a lap for the bulwarks and forecastle plating. The channel fender strake is immediately below the stringer plate and the lower part of it forms the knuckle around the stern. There is one longitudinal frame which runs along at the lower part of the fender strake. At the deck line is shown the scuppers at Nos. 4, 7, 11, 15, 19, 23 and 27, there being 7 in all.

L and M shows the forecastle plating and the strake above, the forecastle bulwarks. Between Nos. 5 and 20 the bulwark is dispensed with, wire lines are rove through stanchions and save any one from falling overboard.

The bulwarks are continued around the vessel aft, making a belt from No. 20 on each side of the vessel. The holes shown in the bulwarks and forecastle plating are for mooring purposes. The one aft is used for towing. This plan could be made from the lines but the quickest and best way is to make a model and run the plate lines in on same. In this case a model was made 1/8 in. to the foot, and the longitudinal frames run in, which were evenly divided up, the longitudinals above the bilge being run in parallel with the sheer and in bottom parallel with the center line. The plate edges are run in practically the same, the edges being kept clear of the longitudinals.

This plan was produced from measurements, measured around the transverses on the model, and set up on perpendicular lines representing the transverses as shown and numbered on plan. The measurements were taken on a strip of white paper and the points marked on the plan determined the line of both plate edges and longitudinals. The plan being made to the same scale as the model, the points obtained from the model were found correct and no changing was necessary when the battens were held to it.

Audiffren-Singrun Refrigerating Machine

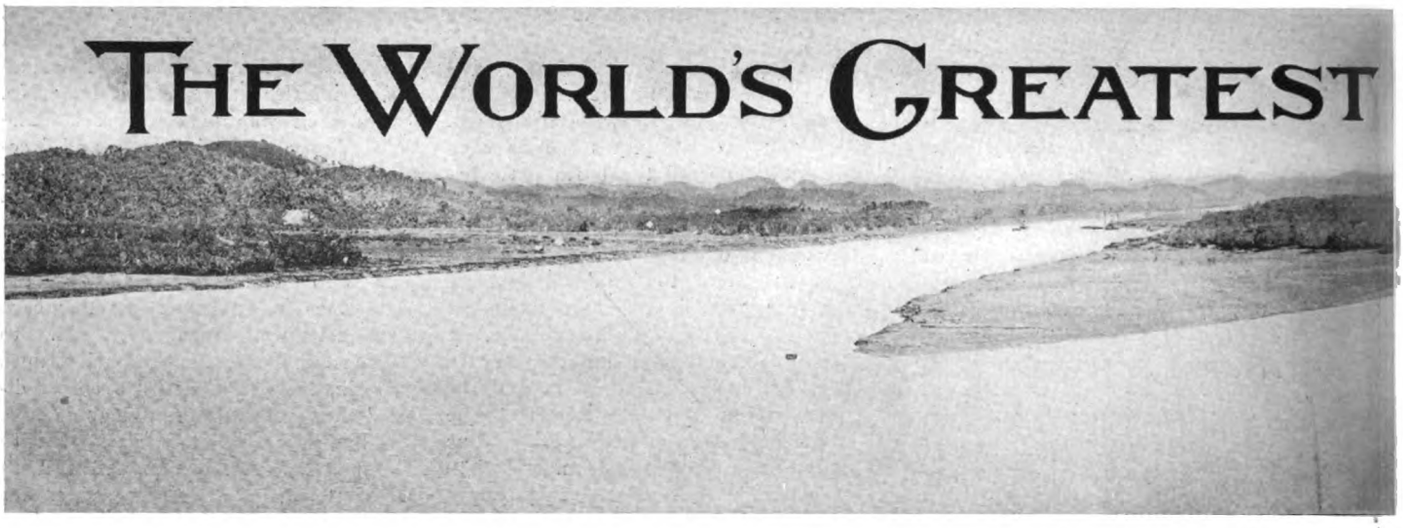
The H. W. Johns-Manville Co. has taken the American agency for the Audiffren-Singrun refrigerating machine. It is said of this machine that it is the first practical, efficient and fool-proof small-unit refrigerating machine on the market. One of the most novel features of the machine is the fact that the compressor operates in the atmosphere which it compresses within a hermetically sealed condenser. Sulphur dioxide is used as the refrigerating agent. The machine consists of two globes joined by a hollow shaft which carries on its extension a pulley or shaft. In appearance it resembles a large dumbbell. Any form of motive power can be used—steam, gas, gasoline or electricity.

The Standard Oil Co. has given contract to the Staten Island Ship Building Co., Port Richmond, N. Y., for a steel tug 90 ft. long.

The Maryland Steel Co., Sparrows Point, Md., has launched the steamship Montana for the American-Hawaiian Steamship Co.'s fleet.

Generated on 2024-07-25 21:53 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

THE WORLD'S GREATEST



THE PACIFIC ENTRANCE TO THE PANAMA CANAL

IT MAY be set down in the premise that the Panama canal must be seen to be understood. Neither words nor pictures can convey an adequate comprehension of the task—it is so overwhelmingly big that its proportions overreach one's imagination. The first surprise is to perceive the large amount of work that was performed by the French and to marvel at their perseverance in the face of the frightful decimation of their ranks. One encounters their work in all parts of the Isthmus, and about 22 per cent of it has been incorporated in the present work. The French excavated, all told, 80,000,000 cu. yds., which is equal to the total excavation from the Culebra cut by the Americans from 1904 to 1912. The French did amazingly well considering their equipment. Over 100 of the locomotives, excellent specimens of workmanship, with copper boilers, are still at work in the canal.

De Lesseps was fresh from his triumph at Suez, when his little daughter turned the first spadeful of earth at Panama. He was eager for a sea level canal, which was quite natural, and which is also quite possible, but his great heart would have been broken and his stockholders ruined by Culebra. That mountain has an irritating and most uncomfortable habit of filling up the cut by slides periodically—and the latest is the greatest of them all. This slide, Cucaracha by name, occurred last month —February, 1913—and it is a sight to behold. We are inclined to look upon the great pyramid of Egypt as one of the great engineering feats of mankind, the work of countless hands and a monument to human patience; but the slide of Cucaracha is greater in cubic contents than Egypt's mighty pyramid.

Cucaracha has from time to time thrown back into the canal practically one-tenth of the total amount excavated in the basin from the Atlantic to the Pacific—and it will throw back many millions of yards more. It is doing this to a lock canal. What it would do to a prism that would have to be 85 ft. deeper for a sea-level canal can readily be conjectured. It would have been the despair of De Lesseps, for his comparatively tiny equipment could not have coped with it. Cucaracha is on the east bank of the canal, just south of Gold Hill, forming the southern slope of the hill, and embracing an area of about 47 acres. This giant slide start-

VIEW OF PORTO BELLO, SHOWING THE SHELTERED CHARACTER OF

Generated on 2024-07-25 21:54 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

VITH THE TOWN OF BALBOA ON THE RIGHT

ed a half-mile back from the canal and pushed its way resistlessly across the basin, a tropical glacier, in fact, advancing at a uniform rate of about 14 ft. in 24 hours, destroying tracks and actually rising on the west bank until the only track left upon which the dirt trains could get through was the 95-ft. level. Gangs of workmen are constantly kept busy laying new tracks and trains rush in and out like shuttlecocks—and yet, after two weeks of effort, the impression upon the slide was scarcely perceptible. Cucaracha is the true form of slide.

Lack of Lateral Support

There is another kind of slide continually occurring. It is no uncommon thing to walk along a track and then returning an hour later to find the track lifted at least 1 ft. One notes it by the fact that he has to step down from which was formerly the bottom level. Lieut. Col. Gaillard reports that he was once lifted 6 ft. in five minutes from the bottom of the cut, but so imperceptible was the movement that he thought the steam shovels were sinking and not he rising. This kind of slide, the most notable of which is on the west bank at Culebra, is caused by the absence of the lateral support to the banks which was afforded before the excavated material was removed from the canal basin. The great pressure evercised by the banks, estimated at 400 lb. per sq. in., enough to burst any boiler, crushes the underlying layers of soft materials, causing a settling of the banks and a consequent bulging up at the point of least resistance, which is obviously the bottom of the canal, resulting in its elevation, including tracks, locomotives, steam shovels, drills and other equipment, to a distance of 30 ft. or more. Then the banks themselves begin to move resistlessly into the cut, filling the basin, and the work of excavation begins all over again.

The Culebra slide, being in fact a combination of many slides of this character, exceeds now in actual area the great slide at Cucaracha—about 7,500,000 cu. yds. having been taken out of it and probably 3,000,000 cu. yds. remaining. But the estimates must undergo constant revision as the slides are constantly recurring. The great Culebra cut is nearly 9 miles long and there are over 20 slides along its length. It no longer surprises the workmen to see a hump in the canal bed, involving, say, 50,000

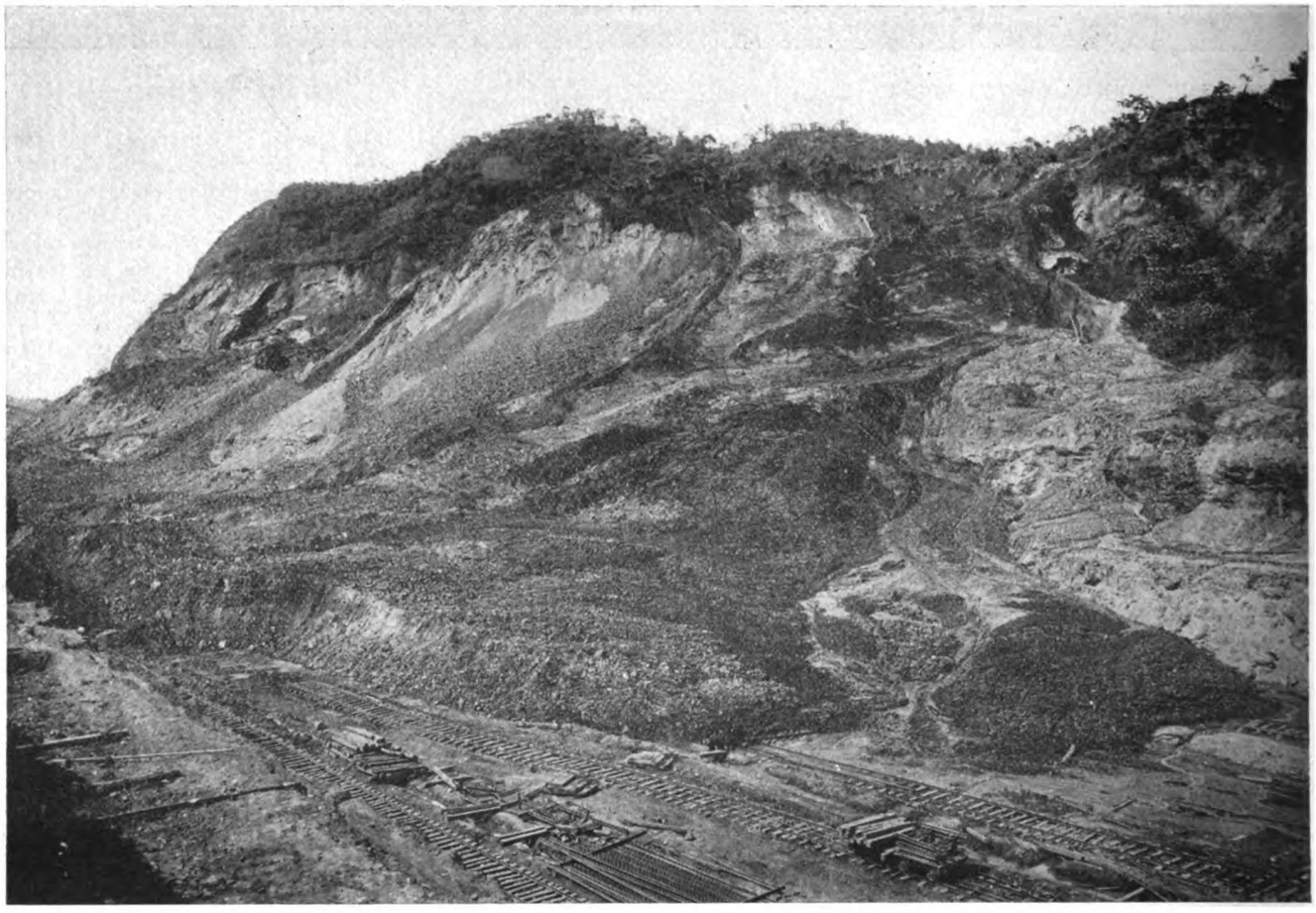
IE HARBOR WITH ROCK QUARRY ON THE EXTREME RIGHT

Generated on 2024-07-25 21:54 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

tons, that was not there the night before. About a mile north of Cucaracha, on the west bank, is the slide of Empire, a matter of 1,250,000 cu. yds. This slide made necessary the removal of a number of buildings occupied as a construction camp, and there are some buildings remaining on the crest of the hill that seem to occupy a precarious position, though as they are on a foundation of rock they are probably secure for the time being. Fortunately the slides are so deliberate that no one has as yet been injured by them, though in one instance 400,000 tons of rock slipped into the canal at Empire in 15 minutes. In this instance it was impossible to remove the equipment and tracks, cars and steam shovels were buried beneath it.

The problem of the slides has vastly complicated the work. In the 9 miles of the Culebra cut over 200 miles of track have been destroyed by slides, and during the past two years trains have had to be operated on a surface which changed its elevation anywhere from 1 to 2 in. to several feet per day, keeping the track gangs busy to provide for the uninterrupted operation of the trains. About 150 train loads of dirt are hauled out of the cut each day, which means that 300 trains are shooting in and out of the cut every eight hours. It is like looking at the toil of Titan to watch the work on the various levels, scores of steam shovels at different elevations loading a car in six trips of the bucket, pouring out clouds of steam meanwhile; empties rushing in on new-laid track at what appears to be breakneck speed; loaded trains puffing away to the dumps, which may be anywhere from 2 to 20 miles away; drills maintaining a ceaseless grind, when suddenly a shrill whistle sounds above the din and workmen scamper like ants in all directions and a mighty explosion of dynamite shakes the ground and fills the air with an incredible clamor; and then one's eyes wander heavenward and he sees what until now has escaped his sight—steam shovels patiently working at an elevation of 300 ft. or more in the bank to relieve the top weight and thus reduce the number of slides caused by mere pressure. It may develop that the greater part of Gold Hill, the highest position in the Culebra cut, where the excavation to the canal bottom is now 494 ft. deep, may have to be removed before the slides cease. It is an almost perpendicular precipice of loose earth without lateral support.

The recent slide at Cucaracha has upset all calculations. Trouble at this point began to manifest itself as early as 1907 and up to the first of the present year about 3,500,000 cu. yds. had been removed. For over a year and a half, however, no slides had occurred at this point, and it was the settled opinion that the Cucaracha slide was caused by saturation due to rainfall—in other words, an exclusively wet season slide. Now it has broken out in greater proportions than ever in the dry season and to its present performance is due the rush order to the Bucyrus Co., of Milwaukee, for two dipper dredges with buckets of 15 yds. capacity each, to be delivered, one in November and the other in January next. The plan now is to turn the water from Gatun lake into this section and let the dredges handle the slide. It is astonishing with what hopefulness nearly everyone on the Isthmus speaks of these dredges and how much, apparently, they expect from them. They seem to think the dredges will make short work of Cu-



THE LATEST CUCARACHA SLIDE IN THE CULEBRA CUT

Generated on 2024-07-25 21:54 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

GOLD HILL VIEWED FROM THE BOTTOM LEVEL

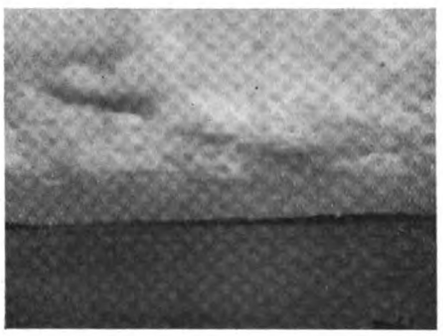
caracha, and it is only occasionally one meets with a man who remarks that a dipper dredge is simply a steam shovel proposition blindfolded. It doesn't seem reasonable that the dredges can handle the slides as well as steam shovels and locomotives.

Moreover, the excavated material at present is used to reclaim swamps and bottom lands, to build the re-located roadbed of the Panama railroad and to establish a foundation for the new town of Balboa—all of which service is rendered easily by the dirt trains, but none of which could be done by the barges. Presumably the intention is to dump the barges in Gatun lake, as they could not be taken to the Pacific ocean without flooding the locks at Peter Miguel and Miraflores.

Possibly there may be a less number of slides when the dynamite explosions cease, but this is a mere speculation. Considering the liberal use of dynamite at all hours and in all portions of the cut, the comparative freedom from accidents is remarkable. There has, in fact, been but one serious accident. The workmen handle the stuff with the utmost unconcern, balancing boxes of it on their heads and stepping from rock to rock as indifferently as though they were carrying so much soap. It seems almost providential that no visitors have been hurt on the locks or in the cut. They may go anywhere they please and the only warning they get of an impending explosion is the usual steam whistle, which to an abstracted onlooker may mean nothing at all. Their safety lies in the workmen themselves, whose actions make eloquent their otherwise unintelligible jargon. On the locks there are numerous holes for the absent-minded to fall into, but no one has tumbled into them as yet.

CULEBRA CUT, LOOKING NORTH

BACKWATER FROM GATUN LAKE IN CANAL PRISM



GATUN LAKE AS SEEN FROM THE SPILLWAY

FRENCH DREDGES WORKING IN PACIFIC SEA LEVEL SECTION

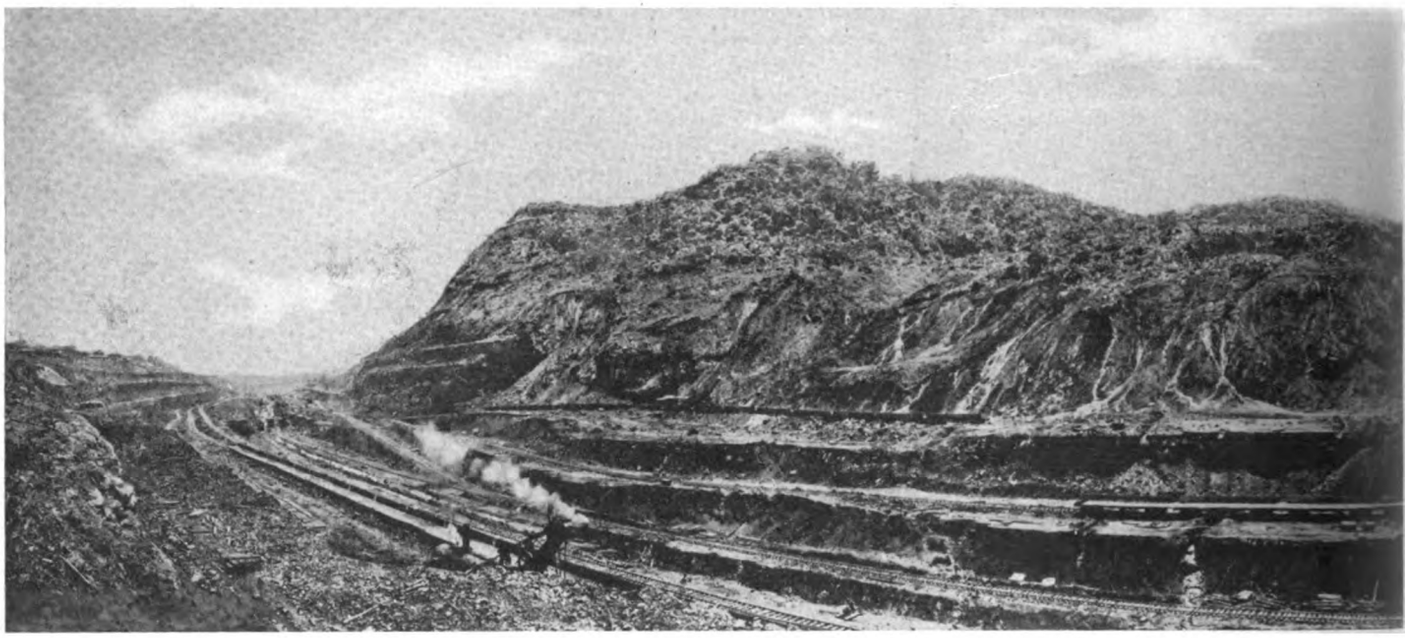
DRILLS AT WORK IN CANAL BASIN

Handling Excavated Material

The handling of the excavated material has reached a high point of efficiency. Four steam shovels will load a train of 20 cars in 20 minutes, 800 tons, and the unloading plow will unload the whole train in five minutes or less. This device is simplicity itself. The dirt cars are of the usual gondola type, built up, however, on one side only, and the plow, which has a spread the width of the car, is attached to the rear of the dirt train, being carried on one of the gondola cars. A wire cable connects

THE SLIDE AT EMPIRE

Generated on 2024-07-25 21:54 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY



PANORAMIC VIEW OF THE CULEBRA CUT WITH GOLD HILL ON THE

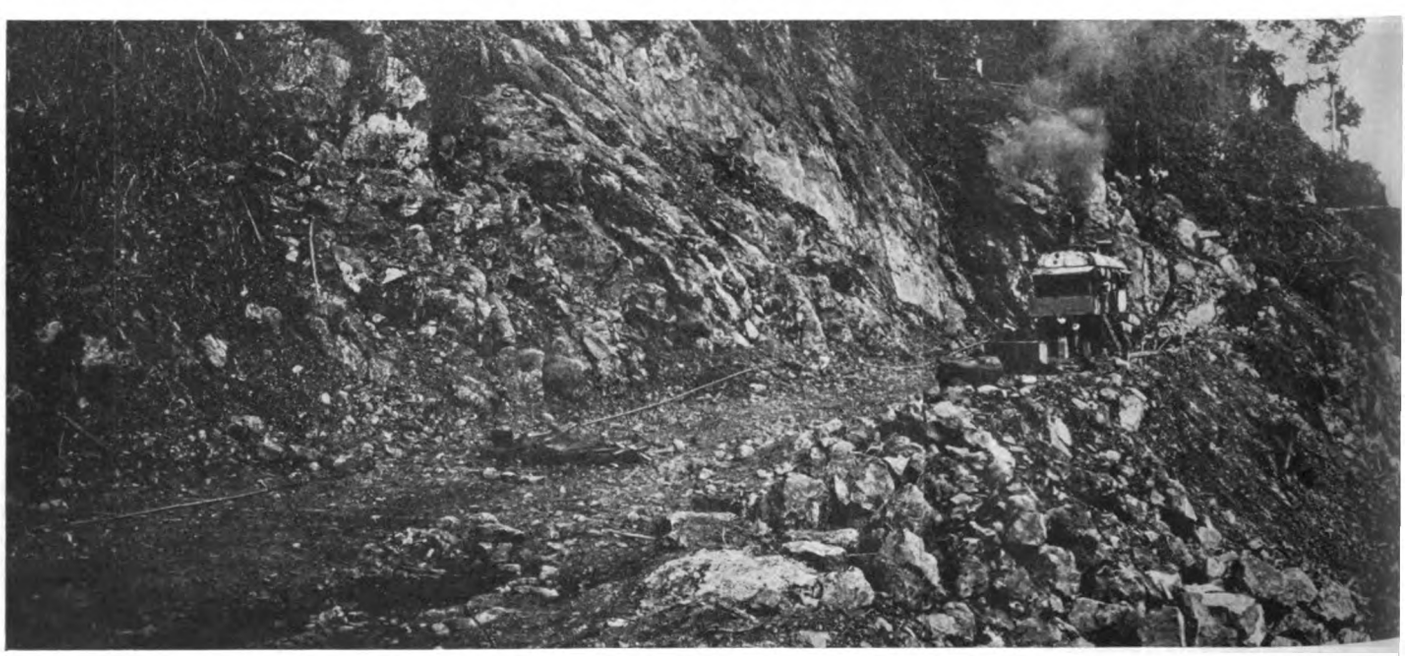
it to a steam drum or winch carried on a car directly in the rear of the locomotive and the whole train is unloaded by merely winding the cable on the drum, which drags the plow across the whole train. The dirt trains usually carry two locomotives, one to supply the winch with steam and the other to pull the train.

At Balboa may be seen the dirt spreader and track lifter—both very business-like affairs. The dirt spreader is merely a steel wing attached to the side of a car which scrapes along the surface of the dirt after it is unloaded, spreading it evenly, folding itself into the car when its job is finished. The track lifter is a locomotive crane fitted with tongs which pick up whole sections of track, rails and ties complete, and lays it either to the right or left of its former location. The track is scarcely shifted before the dirt trains begin running on it to be unloaded by the plow and spread by the spreader—and thus the foundation of a city is being laid upon what was formerly a pestilential, yellow fever breeding swamp. Balboa is destined to be the Pacific port of entry to the zone.

Excavation work is now under way for a dry dock to be 1,000 ft. long and 110 ft. wide, and a breakwater is being built from East Balboa to Naos island, connecting it with the mainland, designed principally to cut off a cross current which comes in from the Pacific at right angles to the canal and which carries a large amount of silt and sand. Docks of ample area to accommodate the largest vessels will also be constructed at Balboa.

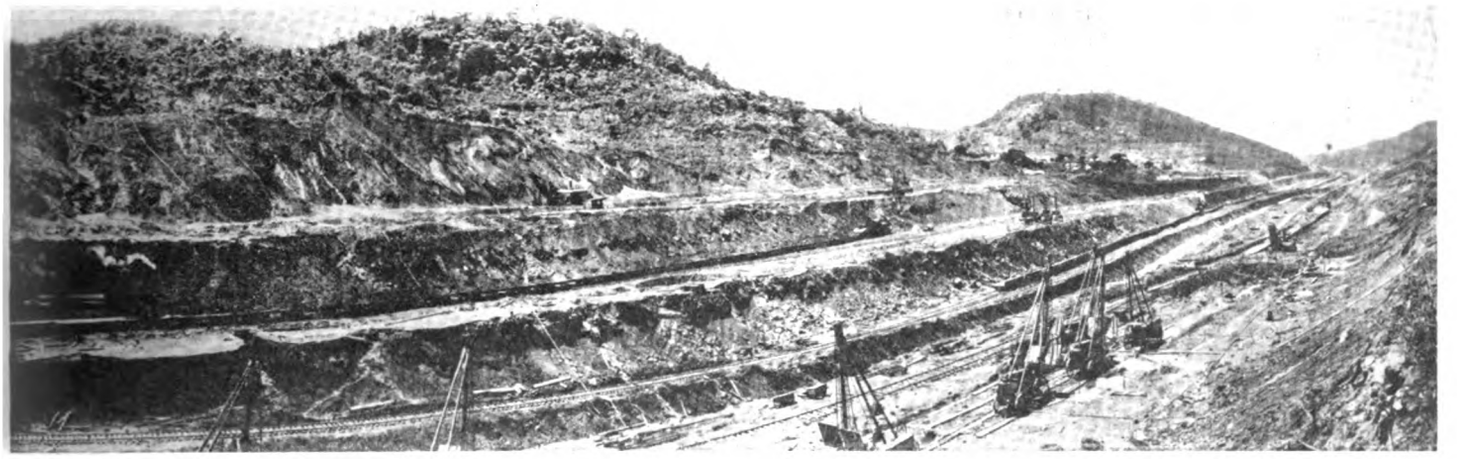
Letting Water in in October

The Cucaracha slide has caused Col. Goethals to extend the time of turning the water into the cut from July to October, though to the casual observer it does not seem possible that it can be turned in at so early a date. It should be understood that the canal has practically been completed from Gatun dam to Gamboa, which



ROCK QUARRY AT PORTO BELLO WHERE ALL THE STONE CAME

Generated on 2024-07-25 21:54 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY



EXTREME LEFT. THIS VIEW IS TAKEN FROM THE WEST BANK

is situated at the entrance to the Culebra cut, a distance of 25 miles, and that portion has already been filled with water, forming Gatun lake. The Chagres river enters the canal at Gamboa, the canal having been dyked near Bas Obispo, just south of Gamboa, in order to keep the water out of the Culebra cut. It was on Sept. 25, 1513, that the great Spanish adventurer, Balboa, first saw the Pacific ocean from the summit of Balboa hill, from which vantage point one may on a clear day see both oceans, and it was doubtless largely sentiment which prompted the desire to send the first boat through the canal on the 400th anniversary of this event; but the Cucaracha slide has made this impossible.

The plan of the canal is easily understood. On the Atlantic side vessels enter a sea level channel extending 7 miles to Gatun, where they are lifted 85 ft. through a flight of three locks into Gatun lake. The locks have a lift of 28½ ft. each. Vessels then proceed at this summit level across Gatun lake, through Culebra cut, which is really an arm of Gatun lake, to the lock at Pedro Miguel, a distance of 32 miles, where they are lowered 30 ft. into Miraflores lake, a small artificial body of water of about 2 sq. miles formed by impounding the waters of the Cocoli, the Rio Grande and the Pedro Miguel rivers. Passing through Miraflores lake, a distance of a mile and a half, the vessels arrive at Miraflores locks, where they are lowered 55 ft. to sea level by two locks in flight, and then proceed through a sea level channel to the Pacific ocean, a distance of 8 miles. The vessels, therefore, pass through six locks in their journey from ocean to ocean, and it is estimated that it will take from 10 to 12 hours to navigate the canal, three of which will be spent in passing through the locks. It should be stated that all of the locks are in duplicate, forming east and west-bound courses.

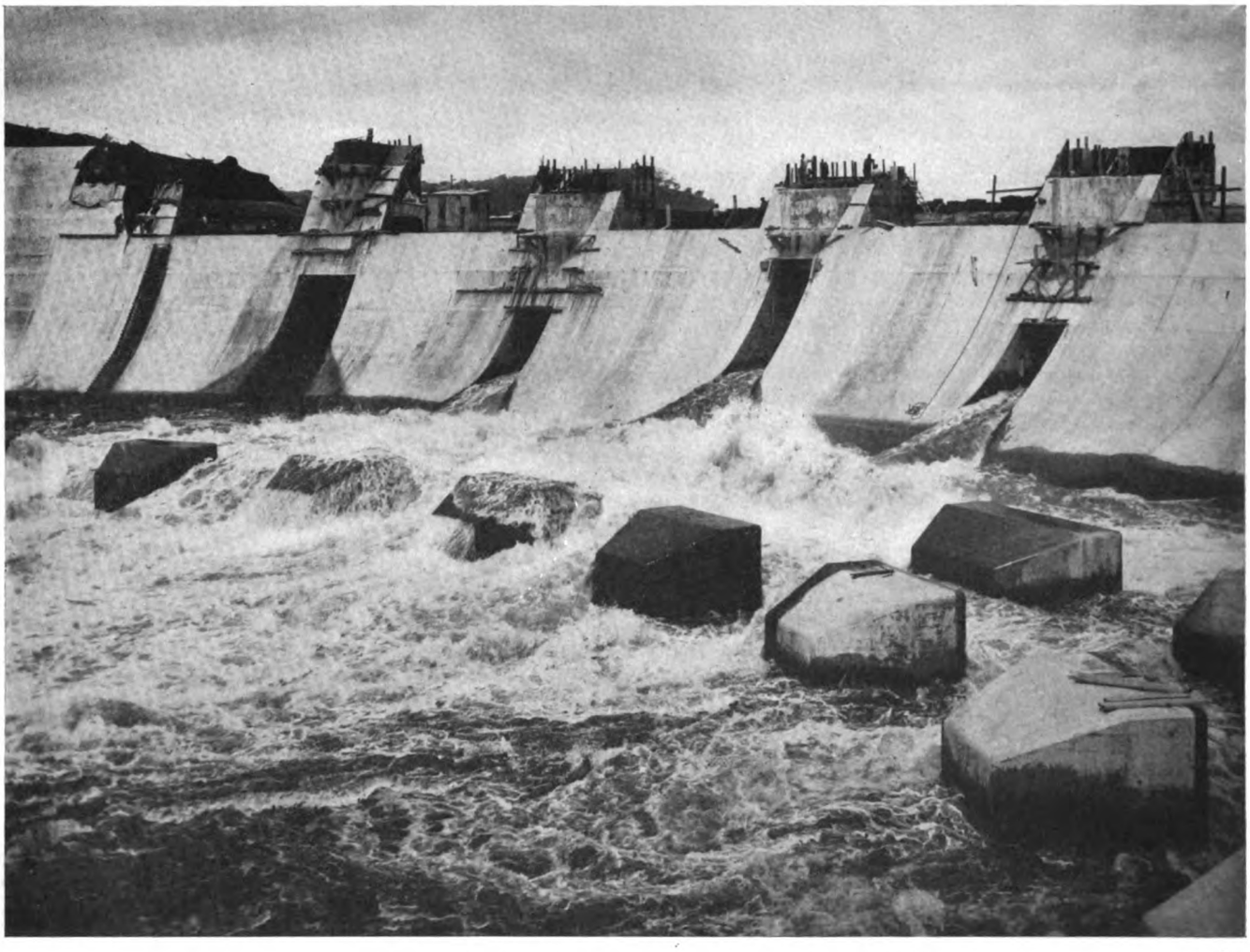
After entering Gatun lake vessels

FROM FOR THE CONCRETE WORK IN THE ATLANTIC DIVISION

Generated on 2024-07-25 21:54 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

may proceed at practically full speed from Gatun to the entrance of Culebra cut. The first 16 miles of the channel through the lake will be 1,000 ft. wide, marked by buoys; then for 4 miles the channel is to be 800 ft. wide, narrowing to 700 ft. for 2 miles, and then for 1 mile before entering the cut it will be 500 ft. in width. Through the Culebra cut the channel will be 300 ft. in width at the bottom and vessels will naturally navigate this portion with caution. The channel through Miraflores lake and in the sea level entrances is 500 ft. in width.

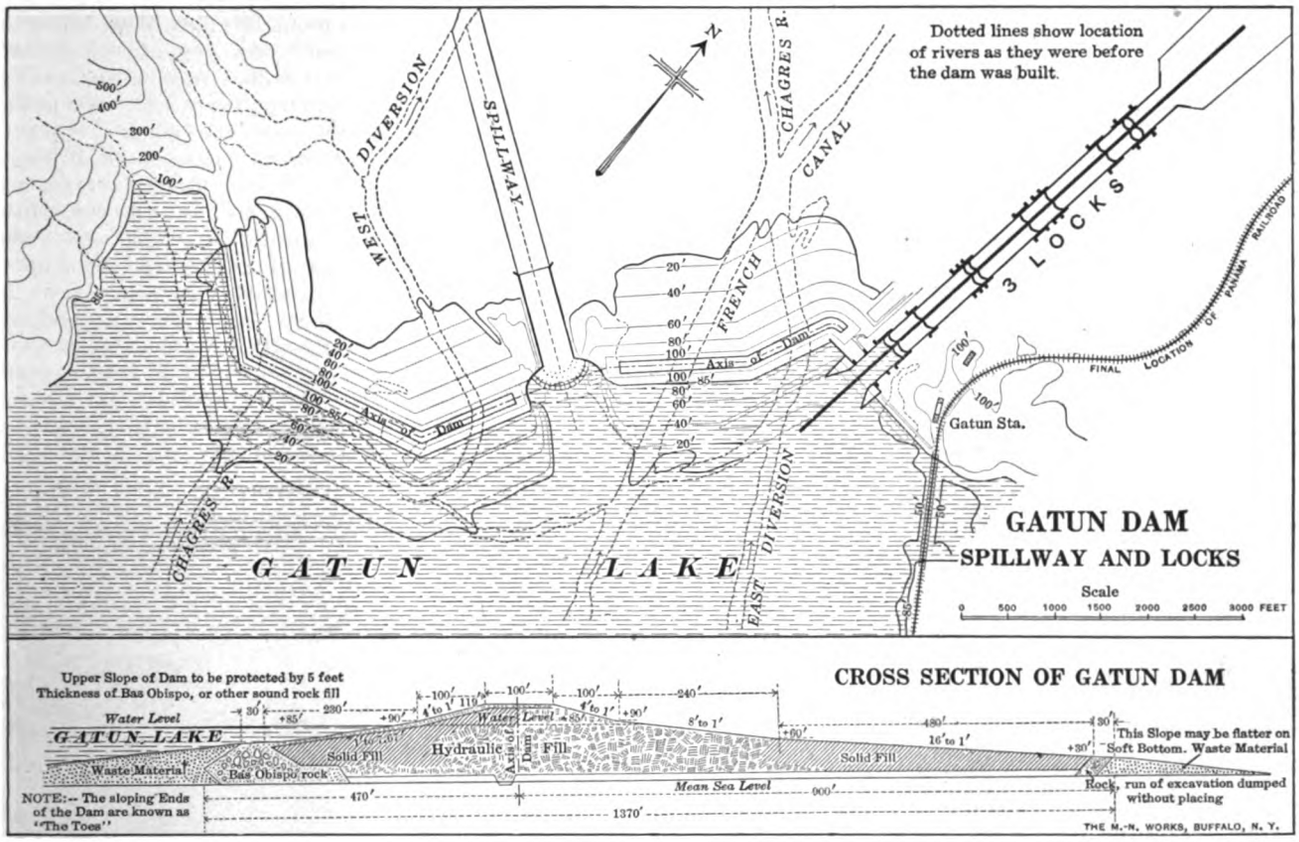
Gatun lake is an artificial lake formed by impounding the waters of the Chagres river and its tributaries by a dam at Gatun, 23 miles from where the river enters the canal basin. It will cover an area of approximately 164 square miles and the depth of the channel through its length will vary from 45 to 85 ft. This dam at Gatun is a wonderful affair. Few visitors appreciate its gigantic and monumental character, because overgrown with grass and shrubs as it now is, it looks like a natural formation; yet it is an artificial mound, 7,920 ft. long, connecting two mountain ranges. Directly in the center of the dam is a little natural hill of rock and this point was selected for the location of the spillway. The dam is 2,100 ft. or about a half mile thick at the base, 400 ft. thick at the water surface and 100 ft. wide at the crest, which is 105 ft. above sea level and 20 ft. above the summit level of the canal. It is located at the only point in the Chagres valley where the natural range of mountains does not entirely surround the basin of the river. The dam, of course, obstructs the Chagres in its progress to the Atlantic, 7. miles away, and to provide for its discharge during construction of the work a diversion channel was made to the west of the spillway location. The dam consists of a core of hydraulically-deposited, impervious silt between two rock fills. These fills, constructed of broken rock brought from Culebra cut, are 1,200 ft. apart and extend along the entire length of the dam, forming its "toes" or lower edges. The space between the walls was filled with silt pumped from the bed of the Chagres river, both above and below the dam, by suction dredges, the water being drained off as the solid matter settled. This hydraulic core was carried somewhat above the summit level of the canal and was capped by a dry fill of about 15 ft. in depth. This weight of dry material with loaded trains constantly running over it has served to make the core compact and to offer great power of resistance to the pressure of water. Over 22,000,000 cu. yds. of rock and earth were used in the construction of the canal, an amount equal to one-tenth the total excavation for the entire canal—in other words, a mountain was removed at Culebra and a mountain was built at Gatun.



THE SPILLWAY AT GATUN IN PROCESS OF CONSTRUCTION

The spillway, as stated, is built in a little natural hill of solid rock in the center of the dam. Its floors and sidewalls of concrete are securely anchored into the solid rock. The spillway is built up solid to an elevation of 69 ft. and is then continued in the form of concrete piers, 8½ ft. wide and 45 ft. apart, grooved for steel gates which close the openings and complete the upper portion of the dam. Water can be discharged

Generated on 2024-07-25 21:54 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY


Dotted lines show location of rivers as they were before the dam was built.
WEST DIVERSION
SPILLWAY
CHAGRES R.
FRENCH CANAL
3 LOCKS
FINAL LOCATION OF PANAMA RAILROAD
Axis of Dam
Gatun Sta.
EAST DIVERSION
GATUN LAKE
GATUN DAM
SPILLWAY AND LOCKS
Scale
0 500 1000 1500 2000 2500 3000 FEET
CROSS SECTION OF GATUN DAM
Upper Slope of Dam to be protected by 5 feet Thickness of Bas Obispo, or other sound rock fill
Water Level
GATUN LAKE
Waste Material
Bas Obispo rock
Solid Fill
Hydraulic Fill
Axis of Dam
Mean Sea Level
This Slope may be flatter on Soft Bottom. Waste Material
Rock, run of excavation dumped without placing
NOTE:-- The sloping Ends of the Dam are known as "The Toes"
THE M.-N. WORKS, BUFFALO, N. Y.

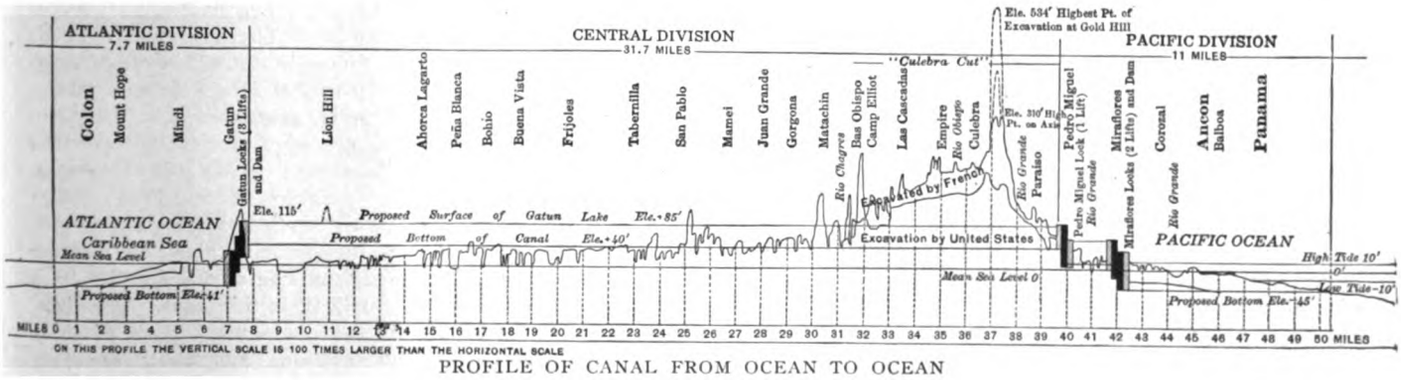
from the lake either over the top of the gates at an elevation of 87 ft., or at an elevation of 69 ft. by lifting the gates. When lifted to their full height the spillway gates will be capable of discharging 154,000 cu. ft. of water per second. This is more than half the water passing over the Horseshoe Falls, at Niagara. It is the intention to close the gates at the latter part of each rainy season, increasing the lake level from 85 to 87 ft. This would give 2 ft. of water over 164 square miles, which is calculated to be sufficient for 58 lockages a day during the dry season.

There is at present about 53 ft. of water in Gatun lake, filling the canal basin from Gatun to the dyke at Gamboa, flooding the bottom lands and gradually climbing the surrounding hills, causing many native huts to be abandoned and dooming many higher up to a like fate. Obviously no effort is being made to remove the dense vegetation in the lake area. It will be taken care of as it decays and floats to the surface. Trees are sticking up everywhere above the water surface and the general impression is that of a forest partially submerged. Nature apparently in the belief that the rainy season has set in has caused thousands of orchids to spring into leaf in the tree tops and they will all be blooming soon.

An Amusing Sight

An amusing sight is to be seen at present at the foot of the spillway. A little water, possibly 2 or 3 inches, is coming through and the pelicans are standing in single column clear across the foot all day long. They have discovered that it is an easy way to make a living for they can catch the little fishes as they come through without stirring a foot. In fact, these pelicans are very wise birds. There may not be any in sight but let a drill boat working in the sea level sections sound a whistle preparatory to blasting and hundreds will immediately appear from all quarters. The moment the blast goes off down they swoop to pick up the stunned and helpless fishes in the surrounding water.

A hydro-electric plant is being constructed on the east of the spillway, intended to generate all the power necessary to operate the lock machinery throughout the entire canal. The penstocks are now being laid and it is estimated that not over 7 per cent of the minimum supply of water will ever be used by the turbines. During the rainy season, of course, water will be so plentiful that it will be



PROFILE OF CANAL FROM OCEAN TO OCEAN

Generated on 2024-07-25 21:54 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

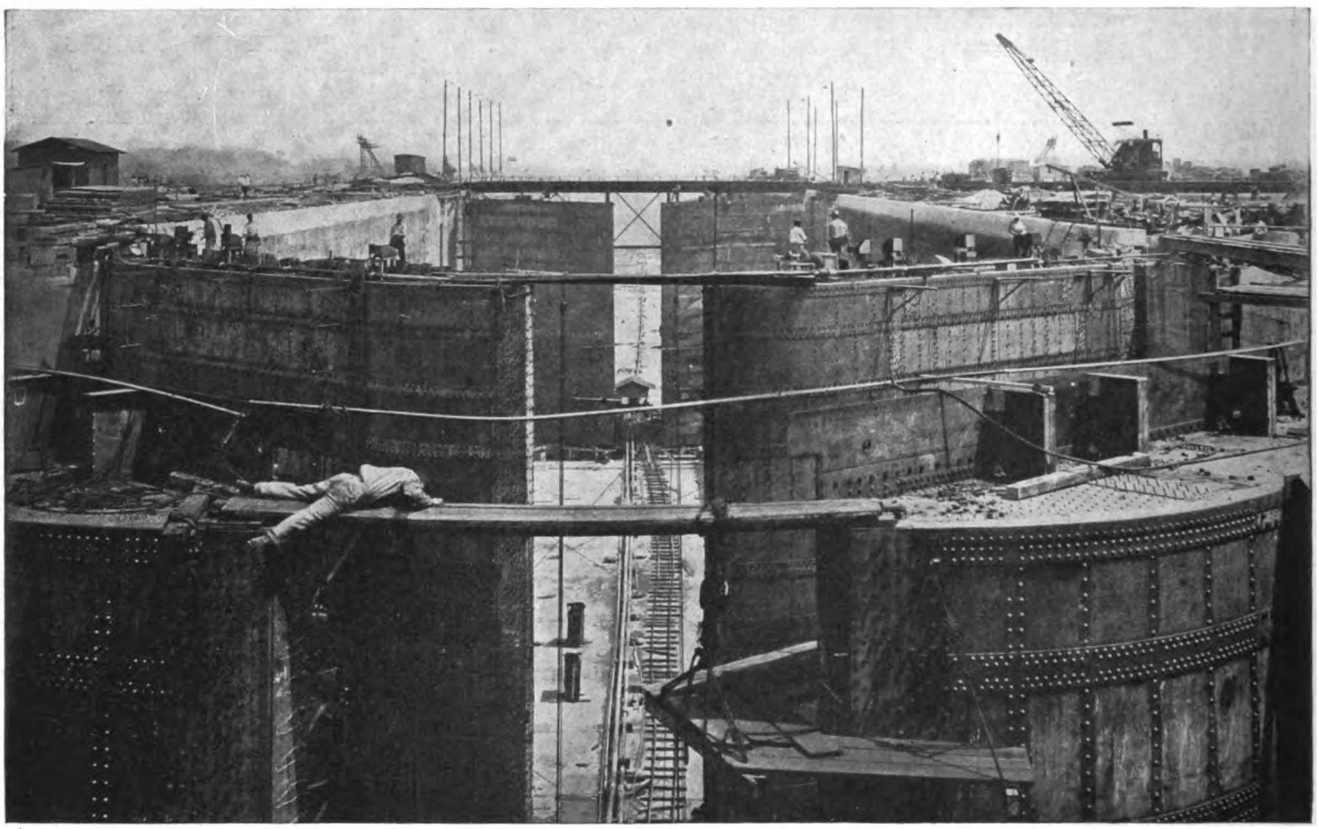
wasted over the spillway. This hydro-electric plant will consist of three 2,500 K. V. A., three-phase, 25-cycle, 250 R. P. M., 2,200-volt, waterwheel-driven exciters with provision for three additional units. The present power station at Miraflores will be retained as an auxiliary to the Gatun plant in case of need. The intention is to drive everything electrically that can possibly be so driven. Over 1,000 motors will be used in the operation of the canal, including the towing of ships through the locks by electric locomotives, the operation of the lock gates, fender chains and pumps, while its use will also be extended to the machine shops, dry docks, coal handling plants, dock cranes, the lighting of the canal and adjacent towns, and eventually to the electrification of the Panama railroad. This enormous electrical equipment is practically all being supplied by the General Electric Co.

The locks, massive affairs of solid concrete and seemingly over designed, greatly impress everyone. It is safe to say that no one ever saw such chambers before. They are simply tremendous, being 1,000 ft. long, 110 ft. wide with a depth of water of 41 2/3 ft. over the sill. Each lock is divided by an intermediate gate into two locks of 400 and 600 ft. each, as nearly all the vessels that will use the canal will come within these dimensions, making unnecessary the filling of the whole 1,000 ft. for each lockage. The side walls are 81 ft. deep, 45 to 50 ft. wide at the floor level, tapering to 8 ft. at the top. The center wall is 60 ft. wide. Both center and side walls carry culverts, 18 ft. in diameter, along their entire length, through which teams could easily be driven, and these culverts in turn are pierced by branch lateral culverts extending up under the floors of the locks, through which the chambers will be flooded. The central culvert can fill a lock in 15 minutes and 42 seconds, or two culverts can fill it in 7 minutes and 51 seconds, and the cylindrical valves are so arranged that the water in one lock can be used to fill the one below it or the one alongside of it. These valves are operated by 7½ H. P. motors.

The approaches to the locks, or guide walls, as they are called, are each 1,200 ft. long on both upper and lower levels and are merely extensions of the center wall of the locks. These guide walls are liberally studded with buffers resting upon steel springs imbedded in the concrete so that a vessel approaching the lock cannot possibly injure the wall or herself in mooring.

The concrete used in the construction of the locks was manufactured in great concrete mixers right at the locks. The Atlantic division obtained its stone from quarries at Puerto Bello, about 18 miles from Colon, and sand from the bed of the Atlantic. The Pacific division obtained its stone from a quarry in Ancon hill, and its sand, a very fine quality, from the Pacific ocean. Cement was carried from the United States in the steamers Ancon and Cristobal, of the Panama Steamship Co.'s line, which, with the Panama railroad, is owned by the Isthmian canal commission.

The lock gates are very interesting. There are 92 of them altogether, considering one leaf as a gate, and they contain about 60,000 tons of steel, supplied by the Jones & Laughlin Steel Co. In fact, 80 per cent of all the iron and steel used in the canal came from the Pittsburgh district. The McClintic-Marshall Construction Co., of Pittsburgh, has the contract for the erection of the gates and other miscellaneous work and from one end of the canal to the other has 4,700 men on its payroll. These gates vary in height from 47 to 82 ft. and weigh from 300 to 700 tons per leaf. About 43,000 rivets, aggregating 21½ tons in weight, are used in each leaf. The gates are built up of big horizontal girders, weighing from 12 to 18 tons each, with vertical framework in between and sheathing plate both on the inside and outside of this frame. Each section is 7 ft. in thickness. The riveting of the component parts of these various sections and their assembly



GATUN UPPER LOCKS, WEST CHAMBER, LOOKING NORTH

Generated on 2024-07-25 21:55 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

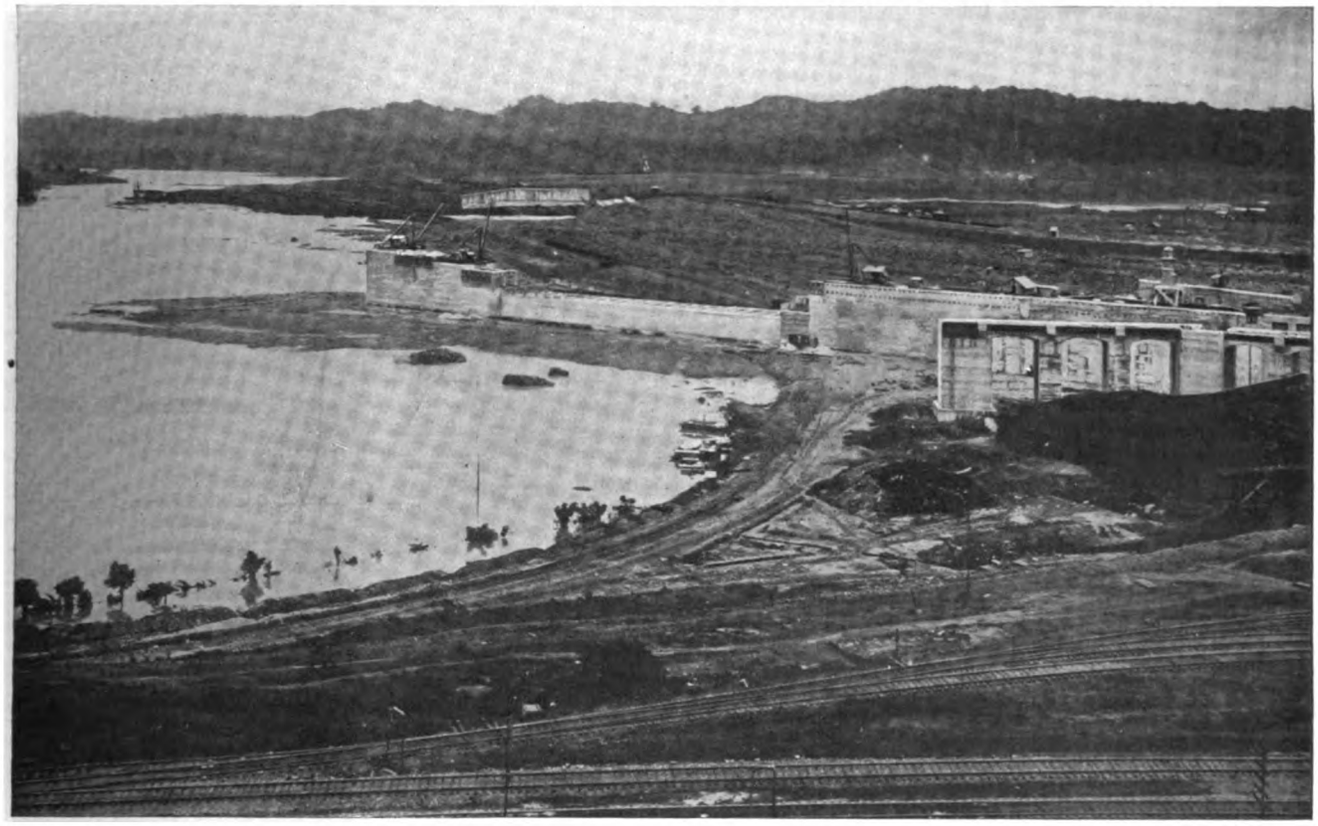
into the finished gate is essentially ship yard work and it was found that the best workmen on this class of work were the black chippers and riveters from Newport News, driving over 250 rivets a day. They are thoroughly competent and seem unmindful of the tropical sun. The fact is that the white workers could not stand the humid and stifling heat on the inside of the framework and the mainstay for this class of work have been the black men from the Newport News ship yard. The gates are cellular in construction and the lower half of each gate will constitute an air chamber which supports about three-quarters of the weight of the gate when submerged. Water will be permitted to flow through openings in the upper half of the gate at the same time that it flows in and out of the lock, thus increasing its weight and mitering efficiency. As the gates will be practically waterborne they will be easy to operate. For this purpose 92 motors of 27 H. P. are required, one for each leaf. In addition, 46 motors of 7½ H. P. each will be employed to operate the miter forcing machine whose function is to force the gates tightly against the bottom sill, miter them perfectly and lock them when in that condition. The Wheeling Mold & Foundry Co., of Pittsburgh, has the contract for these miter gate moving machines, and the Richards Manufacturing Co. for the forcing machines.

The McClintic-Marshall Construction Co. expect to be through with the work by November next. They have been operating under difficulties and have suffered delay at Pedro Miguel and Miraflores owing to the fact that the canal commission could provide no proper place for the reception of their material, not having completed the fill about the locks and, therefore, needing the space for the operation of the dirt trains. Moreover, much of the concrete work, upon the prior completion of which some of the steel work depended, was delayed. The experience gained in the execution of this great contract, one of the greatest single contracts ever let in the United States, has been of exceptional value to the company. The efficiency of its personnel has steadily increased with the progress of the work and what was performed with great effort at the beginning of the work is now done with comparative ease. This is notably so in the building up of the gates. What took months to accomplish in the early days is now done in so many weeks.

Possibly it is due to the fact that the canal is being built by the war department for the use of the navy and merchant marine that so many possible, or one might more correctly say, impossible contingencies have been provided for. One can plainly see the influence of the accident at Sault Ste. Marie three years ago upon the design of the locks and it is quite irritating to a navigator to have such emphasis placed upon it. The accident to the Crescent City, which was entering the Canadian lock when the Perry Walker rammed the lower gate in 1909 was the first in 54 years, and in all probability it will never be repeated. But the builders of the Panama canal are taking no chances.

To begin with, the gates at the upper and lower end of the highest lock in each flight are in duplicate, being about 50 ft. apart. It would, therefore, be necessary for a vessel to ram both gates before crippling the lock. But before it could do this it would have to break through a fender chain, forged from stock 3 in. in diameter, stretched across the prism in front of the upper gate and operating upon hydraulic cylinders set in the lock walls, the pumps being driven by 48 70-H. P. motors. These cylinders are designed to pay out the chain with such resistance as to stop a 10,000-ton ship moving at 5 miles an hour before it could strike the upper gate. When not in use these chains are lowered into a well in the floor of the lock chamber.

In the event that a vessel breaks through the fender chain and rams both upper gates a further remarkable



UPPER ENTRANCE TO GATUN LOCKS, SHOWING GATUN LAKE BEGINNING TO FORM

Generated on 2024-07-25 21:55 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

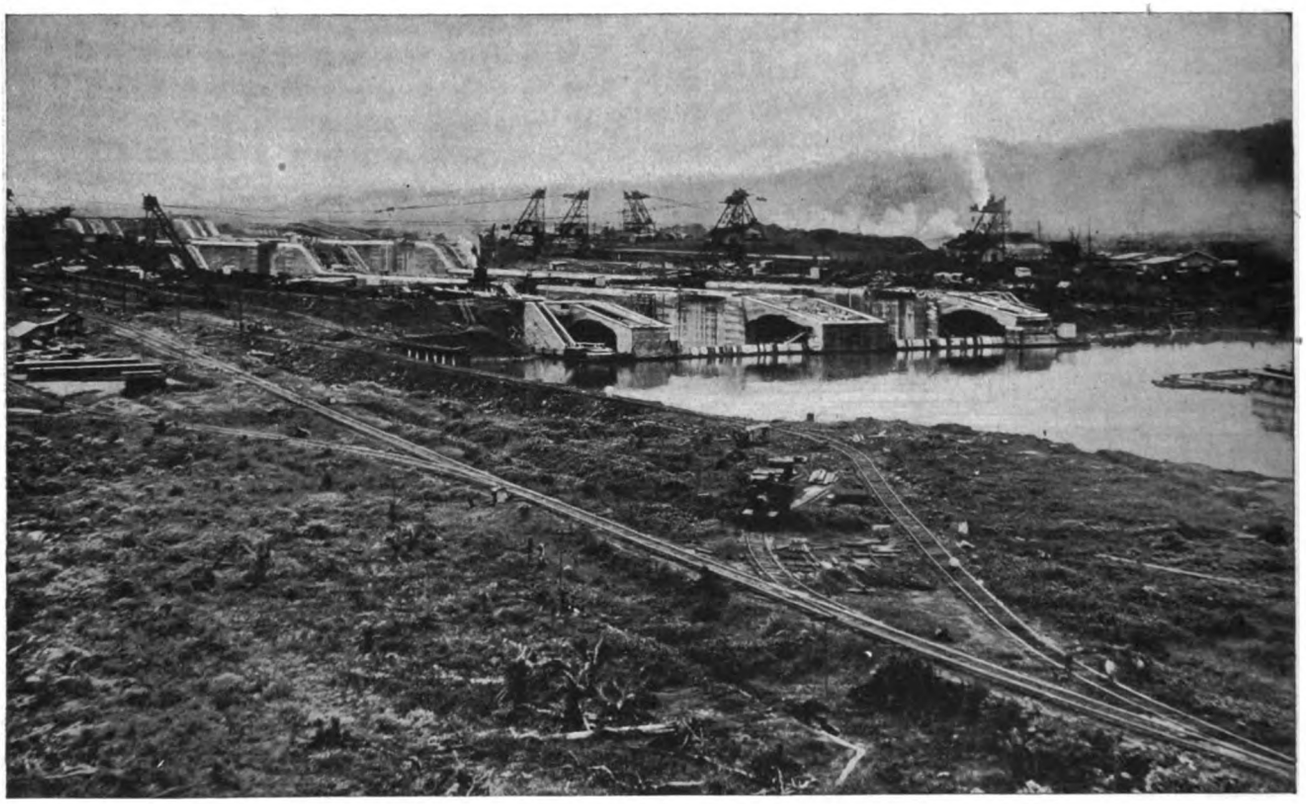
contrivance has been provided in the shape of an emergency dam for checking the flow of water. There are six of these emergency dams, one for each flight of locks. They contain altogether 16,000 tons of steel and the American Bridge Co. has the contract for fabricating and erecting them. These emergency dams are virtually swing bridges and are located about 200 ft. above the upper gates. Should occasion require the use of one of these dams it will be swung across the lock approach and from its lower side a set of open-work wickets will be lowered, engaging in a grooved sill in the floor. When these wickets are in place, arresting in part the flow of water, small plates resembling little flat cars will be let down, one on each wicket, building up a row of plates clear across the bottom. When the first complete set of plates has been let down 9 ft. of the water will have been shut off. Another set of plates will then be lowered and the process continued until the flow is completely under control. As the plates are not intended to be watertight there will, of course, be some seepage but this will be cared for by a floating caisson or gate which will be towed above the dam in the now comparatively still water and sunk against a sill at the upper end of the chamber by filling it with water. The temporary dam can then be removed and the pressure against the caisson gate will make it watertight.

It must be admitted that these emergency contrivances have been well designed and well thought out. Should a vessel actually ram the gates and admit the waters of Gatun lake to the lock the velocity of flow would be 24 ft. per second and the discharge 90,000 cubic feet per second. Obviously it would be folly to attempt to check such a rush of water at once. It would have to be gradually curbed and this service the open-work wickets are well calculated to perform. The solid plates following would bring the current slowly to rest.

But there is not one chance in a million that these emergency contrivances will ever be put to practical use. Vessels cannot enter the locks under their own power. They are required to stop and moor at the guide wall, from which point they will be towed through the locks by four electric locomotives, two in front towing, one on each side of the canal, and two attached to the stern, one on each side, for steadying the ship. The towing tracks, which are close to the edge of the wall, have a center rack throughout and a pinion in mesh with this rack will always be used by the locomotives. The speed of the locomotives in towing is automatically limited to two miles. In returning they switch to a track from which the cog rail is omitted, permitting a speed of five miles. It can be seen that such a system practically eliminates the possibility of accidents to the locks. Forty locomotives will be employed altogether on the lock walls.

Work Remaining to be Done.

While the locks are in a state of comparative completion the commission has still considerable work to do at Gatun. The guide and flare walls on the Atlantic level are still to be built and present something of a job. It has been found necessary to go to a depth of 70 ft. below sea level to find rock bottom for the flare walls and the depth is even greater for the guide wall, which will probably now have to be built upon piling going to bed rock. The material is too soft to sustain steam shovels and the excavation is being done by suction dredges. These dredges cut their way into the space where the walls are to be built and their passage into the cut was then closed to the sea by an earthen dam. The dredges are now working away within the enclosed area, lowering themselves as they work; but they have to excavate far more than the amount within the enclosure as slides have begun to occur. As soon as they have finished their work the pit will be filled with water and the dredges floated out. The dam across the entrance will then be restored and the pit unwatered



GATUN TRIPLE LOCKS, SHOWING ENTRANCE FROM ATLANTIC SIDE

Generated on 2024-07-25 21:55 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

for the construction of the walls. This is practically the only important concrete work remaining to be done.

Government of the Zone

It should be understood that the city of Panama on the Pacific and Colon on the Atlantic while within the canal zone are excluded from it and are under the government of the Republic of Panama. They have no outlet, however, except through the zone. The port of entry will be Balboa on the Pacific and Cristobal on the Atlantic, which are now being developed by the United States. The docks at Cristobal are among the finest in the world. They are to be 1,000 ft. long and 200 ft. wide, built up-

BIRD'S-EYE VIEW OF PEDRO MIGUEL LOCK AND APPROACHES

on steel caissons sunk to bed rock and filled with concrete. There are to be five in all and one of them has been finished. The slips between them allow ample sea room for the largest vessels to pass each other in safety. The docks will be equipped with cargo handling appliances and will have sheds for the protection of freight. Across the entrance to the canal from the docks will be the coaling plant, where it is intended to keep 250,000 tons of coal constantly submerged in a concrete trough in addition to the amount on dock for immediate use.

Cristobal is situated in Limon bay and the harbor is protected by a breakwater extending northeast from Toro Point, a distance of 11,000 ft. In addition a wall is being built in connection with the dock improvement work in Cristobal behind which the docks are being located. A further breakwater, however, will have to be constructed from the headland opposite Toro Point, as the swells of the Atlantic, even in moderate weather, while seemingly leisurely are heavy and dangerous. In a gale they would beat in with such tremendous force that no vessel could possibly remain at dock.

It is strictly within the truth to say that from the sanitary standpoint, the Zone is one of the sweetest places on earth in which to live. Col. Gorgas and his assistants certainly did a good job of sanitation. Everywhere the extreme cleanliness of the place is apparent. There are no flies and few mosquitoes. Garbage is collected every day. The house fly does not have a chance to breed and every pond, where a mosquito might breed, has a little oil automatically dripping into it all the time. The yellow fever mosquito has been entirely exterminated, and while there are some malaria breeding mosquitoes still at Gatun, owing to the character of the work now going on in naturally swampy land, they will shortly be exterminated.

The physical well-being of the workmen is jealously guarded. Excellent hospitals are maintained at Colon and Ancon, and every passenger train carries a hospital car. A sanitarium for convalescents is maintained on Toboga island, 12 miles out in the Pacific. Houses, with porches, doors and windows entirely screened, and containing all things necessary for housekeeping, are furnished free, together with light and fuel. Coal and wood are delivered free each day to every house. The commission also conducts dining rooms at all of the construction towns, where excellent meals are served to the workmen at 30 cents each.

From one end of the Isthmus to the other the name most frequently mentioned is that of Col. Goethals. He seems to have won, not only the respect, but the real affection of the rank and file, who are prepared to do anything for him. He is, therefore, an ideal executive officer.

In conclusion the Isthmus is quite disturbing to one's sense of orientation. For instance the sun rises in the Pacific at Panama and sets on the Atlantic at Colon, a staggering and incredible circumstance until one learns that Panama is 22 miles east of Colon. The line of the canal traverses the zone in a general southeasterly direction and while the distance from shore to shore is only 40 miles, the canal, owing to changes in direction, is 50 miles long.

The illustrations on pages 95 to 99, inclusive, are reproduced with permission from John Barrett's book on Panama, published by the Pan-American union.

606675

Generated on 2024-07-25 21:55 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

A Steel and Concrete Ore Dock

PRESQUE ISLE ORE DOCK OF THE LAKE SUPERIOR & ISHPEMING RAILROAD. THE STEAMER J. H. SHEADLE IS BERTHED FOR A CARGO

THE new concrete and steel dock of the Lake Superior & Ishpeming railroad at Presque Isle, Mich., received its first train on Aug. 4, 1912, and loaded its first ore boat, the Sinaloa, on Aug. 5. This dock replaces the old wooden structure which had been in service for about 16 years. Since the building of this first dock the ore-carrying trade of the great lakes has been revolutionized and it was with difficulty that the larger class of carriers could be loaded at the dock. The modern carrier is pretty high out of the water when she is light and consequently there was not enough pitch to the spouts to make the ore flow freely.

Comparative Cost, Concrete and Steel.

Before undertaking the construction of the new dock, the relative costs of different forms of construction were considered. Estimates showed that a concrete and steel dock would cost about 167 per cent and an all-steel dock 185 per cent of the cost of the timber dock. The total cost on a long term basis, however, was found to be very much less for the concrete and steel design than for either of the others. The cost of maintenance is obviously much diminished and it is understood that cost sheets which have been compiled since the dock went into commission show that operation costs are only one-fourth to one-third of those for the old dock.

The general dimensions of the dock are as follows: The dock proper is 1,200 feet long, 75 feet above water, 60 feet wide at the bottom and 54 feet wide at the top. There is an approach fill of 1 mile in length on a 1.5 grade, a trestle 600 feet long and a tail trestle, 60 feet long. There are 200 ore pockets, ranging in capacity from 250 to 300 tons each. Four railway tracks extend the whole length of the dock.

The structure is supported on about 10,000 Norway pine and tamarack piles which are enclosed between two lines of 12-inch sheet piling. The piles are from 30 to 45 feet long, spaced from 2 to 5 feet apart in transverse rows, 3 feet apart. All of them are vertical with the exception of pairs of inclined brace piles in alternate spaces between the transverse rows. They were driven in water from 2 to 24 feet deep and to a penetration of about 20 feet in the hard, sandy bottom. All of them were driven by a 5,000-pound Vulcan steam hammer aided by a hydraulic jet at 100 pounds pressure through a 1¾-inch nozzle. They were driven at the rate of about 75 piles per 10-hour day by one floating and two land machines, and the depth of the water, the exposed situation and other conditions were such that the cost of supplies and maintenance equalled the direct labor cost for driving the piles. The pile tops were very accurately and rapidly cut off at low water level by a circular saw mounted on a vertical shaft at the extremity of the 60-foot arm of a turntable trussed platform, counter-balanced by a boiler and steam engine. The turntable was mounted on a pile driver bed sill and moved down the center of the dock, commanding the full width of the substructure and cutting a number of piles from one position.

The lines of sheet piling inclosing the foundation piles were tied together across the top, from wale to wale with 1¼-inch tie rods and the space between filled with dredged sand. These tie rods were imbedded in the bottom of the concrete slab. The sheet piling was 12 x 12-inch Oregon fir with 4 x 4-inch hardwood strips nailed on two sides to form a dovetailed tongue and groove. After the sand filling was in place the concrete slab, dock walls and column footings were placed. The 3-foot slab was reinforced laterally and longitudinally by old wire hoisting rope. This rope was from 1 to 1½ inches in diameter and was obtained from neighboring mines at scrap prices.

A feature of the dock wall construction was the use of a steel facing plate extending from the bottom of the concrete to a height of three feet above low water. This plate is supposed to prevent the disintegration of concrete from freezing and abrasion of ice, government breakwaters in the neighborhood built only a few years ago showing the need of some protection of this sort. The total length of slab is over 1,500 feet and it was built without expansion joints. The whole foundation is extremely rigid and is so massive that it is capable of withstanding very heavy bumps from large vessels. The work of placing the foundation slab was followed by the erection of the reinforcement for the columns, struts and bin partitions to the full height of the structure. The semi-circular bin fronts and some other parts of the steel work were not erected at this time.

The main columns of each bent are each 28 x 36 inches in size and are connected in pairs by 12-inch vertical

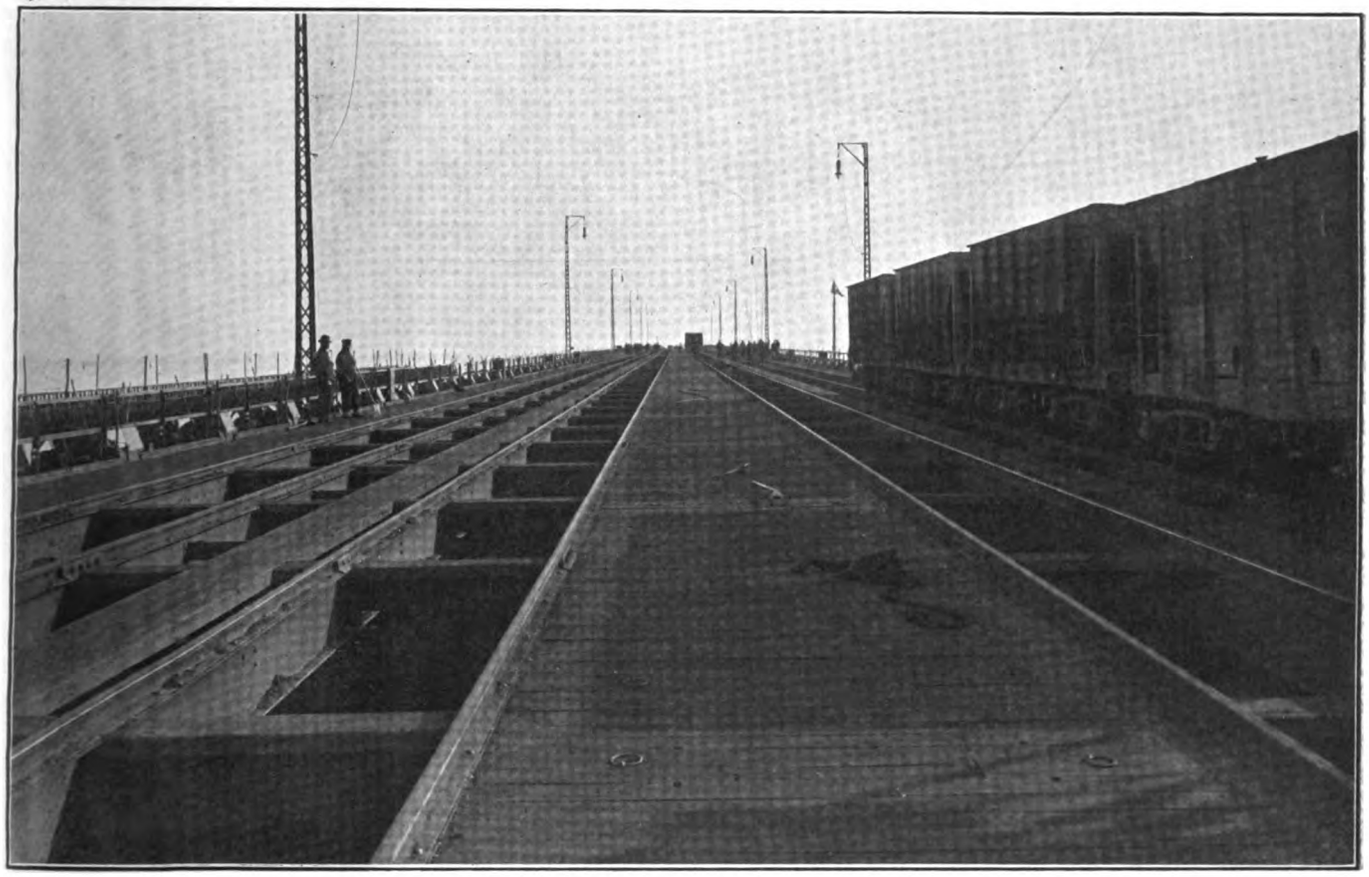
Generated on 2024-07-25 21:55 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

walls. They are each reinforced by four 2½ x 2½ x ¼-inch angles, box-laced. The columns and walls which also carry load were really figured as plain concrete, carrying between 400 and 500 pounds per square inch. Slight reinforcement was put in to prevent cracking and to form a positive means of tieing the whole structure together, both laterally and longitudinally.

Forms were placed and the concrete was poured in lifts of approximately 12 feet. No expansion joints were provided in the 1,200 feet of dock, but expansion joints were placed at each end where it joins the steel trestles. no vibration from trains can be felt even when brakes are suddenly applied.

The ore bins, 54 feet long, transverse to the axis of the dock, 12 feet wide on the centers and about 30 feet in extreme depth, have A-shaped flat bottoms pitched away from the center line to discharge on both sides of the dock through two 44 x 60-inch vertical-hinged gates or doors in the semi-cylindrical steel plate ends of the bins. The transverse vertical side walls of the bins are made of reinforced concrete which fills and incloses the outside columns continued to the top of the bin to afford riveted connection inclosed upper surface of the floor receive a wearing surface of inclined 3-inch maple planks laid parallel to the transverse walls. In the semi-circular ends of the bins the floor is covered with a steel plate riveted to vertical plates forming a short trough to which is pivoted the upper end of the steel loading chute, 35 feet long, which can be revolved through an arc of nearly 130 degrees by the suspension line attached to it near the bottom and led over a sheave at the top of the bin.

The design of the chutes and operating machinery were worked out specially for this dock and differ materially from those previously in general

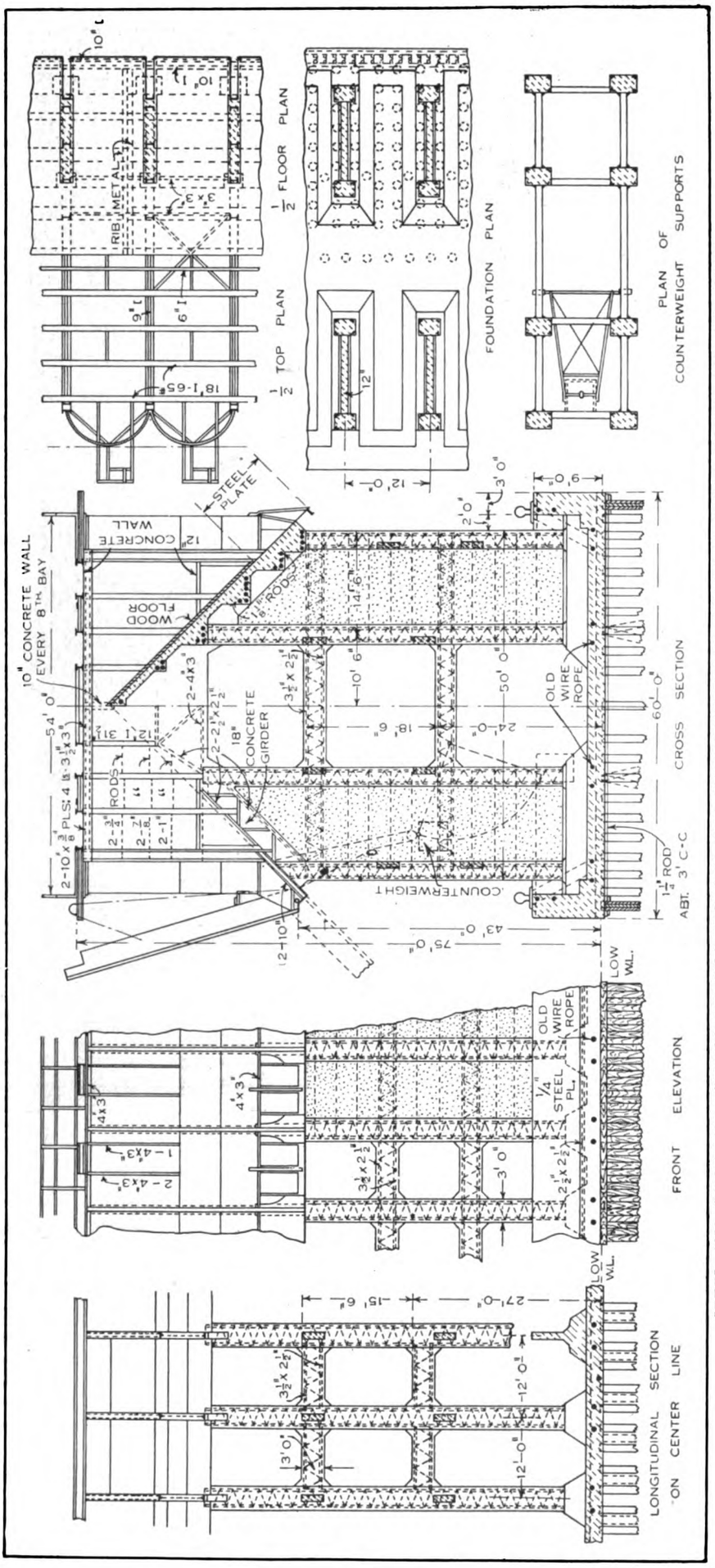


A VIEW OF ONE SECTION OF THE TOP OF THE PRESQUE ISLE DOCK

The outside panels between the columns in each transverse bent are braced by solid reinforced concrete diaphragms 12 inches thick, cast integral with the columns. At each end of the dock three panels and intermediately, every seventh and eighth panel between the outside columns, are braced by single full height reinforced concrete longitudinal diaphragms intended to resist the stresses developed by braking heavy ore trains in bringing them to a stop on the dock. Although the dock has been in commission for several months, no cracks of consequence have been developed and the structure is so massive and rigid that practically for the curved end plates. Full length vertical I-beams are set in the concrete under the centers of the track stringers and there is also a reinforcement of vertical and horizontal rods.

The floor of the bin was made of concrete cast integral with reinforced concrete longitudinal beams, having triangular cross-sections which are framed into the inclined transverse concrete girders connecting the tops of the columns. The transverse girders are reinforced by riveted structural steel work which, with the column reinforcement, made a complete skeleton of the structure under the bins. Longitudinal nailing strips imbedded in the use. It is believed that this is the first instance in which the chute winding cable, drums, counterweight cable and swinging counterweight are laid out in such a way that the chute, which weighs 8,200 pounds, is perfectly balanced in every position. Each set of six adjacent chutes on a side is operated from a 2-inch line shaft driven by a 15-horsepower motor. Each hoist is operated from this line shaft by a friction clutch. Two or more hoists on one line shaft may be operated together, the time required to raise or lower a chute being only 20 seconds. To move the chute, the operator must first release and hold the

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY



STEEL AND CONCRETE DETAILS OF ONE REGULAR AND ONE BRACED LONGITUDINAL PANEL OF ORE BIN AND DOCK

automatic brake with the left hand, and then he holds the lever of the friction clutch in operating position with the right hand. The machinery is simple and all moving parts are well protected by safety coverings.

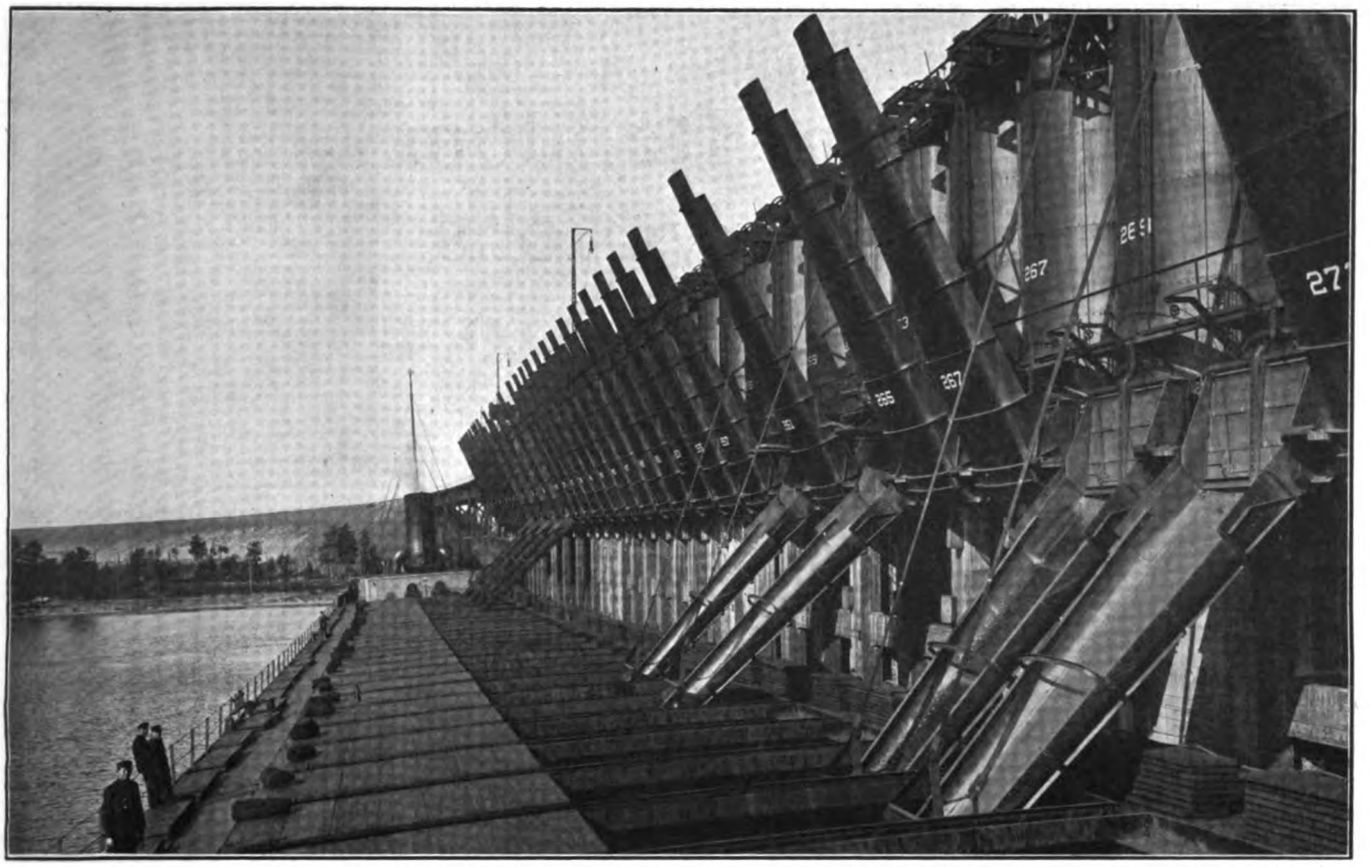
The chute itself tapers from 8 feet, 6 inches at the upper end to 4 feet, 6 inches at the lower end with a curved bottom throughout the whole length. Many ore chutes have been built with flat bottoms, straight sides or with bends in the sides which caused the ore to stick or to spill over. This chute was designed on the theory that soft iron ore flowing with some velocity would act much the same as a stream of water. The behavior of the chute in service seems to confirm this view. When both bin or pocket doors are open the ore flows in the chute about a foot in depth apparently faster in the center and with increasing velocity towards the ends of the chute and the ore does not stick or spill over. The practical effect of this easy flow through the chute is to enable the operator to run ore to the far side of vessels 60 feet or more in width and to trim the boat perfectly. Owing to the absence of sharp angles in the pockets and the location and width of the doors, there is little poking to be done and few men are employed for this purpose on the new dock.

Loading Achievements

Since the completion of the dock no efforts have been made to obtain loading records, though some very good time has been made. On Aug. 27, the steamer Price McKinney loaded 7,733 tons of soft ore in three hours or at the rate of 2,578 tons per hour. On Oct. 24, the steamer Michigan loaded 9,692 tons of soft ore in 4¼ hours, or at the rate of 2,280 tons per hour. A portion of a cargo, 5,600 tons of soft ore, has been run into a boat in 1¼ hours, or at the rate of 4,480 tons per hour. On Oct. 29, 3,344 tons of hard ore were run into the steamer W. G. Mather in 23 minutes, only three men being actually employed in this operation. This was at the rate of 10,000 tons an hour.

The design of the superstructure was made by B. F. Jackson, vice-president of the Wisconsin Bridge & Iron Co., and that of the substructure by R. C. Young, chief engineer of the Lake Superior & Ishpeming Railroad. J. C. Greiner was consulting engineer. The Wisconsin Bridge & Iron Co. furnished and erected the steel and machinery; the pile driving and concrete work was handled by the Raymond Concrete Pile Co., and the Zenith Dredge Co. did the dredging. The

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY



CHUTES FROM THE PRESQUE ISLE ORE DOCK LOWERED INTO THE HATCHES OF THE J. H. SHEADLE

whole work was carried out under the general supervision of R. H. Harris, general manager of the Lake Superior & Ishpeming railroad.

Dock Charges at Shipping Docks

The railways carrying ore to Escanaba, Ashland and Marquette have issued their tariffs for the year 1913, which work out at an increase of five cents and more over the tariffs of preceding years. The rail rate is not increased at all, but the haul applies strictly to dock yards and furnace tracks. In other words, it ends at the approach to the shipping docks. Where the ore is for vessel delivery for points beyond it will be subject to the following additional charges:

> Storage in cars at dock yards, unloading from cars to docks, storage in docks and loading from docks to vessels: If loaded into vessel within ten days from arrival of cars at dock yards five cents per gross ton of 2,240 lbs.
>
> When not loaded into vessels within ten days a storage charge (same will not be made during the closed season of lake navigation, i. e., the interval between departure of the last vessel and arrival of the first vessel); for each day of fraction thereof, ¼ cent per ton of 2,240 lbs. per day after the first ten days.

These tariffs were put into effect by the railways during the latter part of February and include the Chicago & Northwestern railway serving Escanaba and Ashland, the Chicago, Milwaukee & St. Paul railway serving Escanaba; the Soo Line railway serving Ashland; the Duluth, South Shore & Atlantic railway serving Marquette, and the Lake Superior & Ishpeming railway serving Presque Isle.

It was reported a few weeks ago that the railways had decided not to impose this additional charge, but that was an error. They had decided to impose a charge of five cents per gross ton for the second ten days that the ore remained at the dock yard, but this charge was later withdrawn and the charge of ¼ cent per ton per day substituted in place of it.

Corrigan, McKinney & Co., of Cleveland, have made an independent issue of the matter, and have submitted protest against the charge to the Interstate Commerce Commission at Washington, as well as to the State Commission. The ore shippers as a body have also met and considered the subject of concerted action against the increase, but have reached no conclusion. The rail rate to all these points is 40 cents with the exception of Marquette, where it is 32 cents, though it will be understood that the ton-mile rate is higher from these ranges than from the Mesabi and Vermilion ranges, where a flat rate of 60 cents is charged.

There is a feeling among some of the shippers that the matter should be held in abeyance for a year at least, as contracts for 1913 delivery were all made before this proposed change in the schedule was announced.

Alexander McNab, president of the McNab Co., Bridgeport, Conn., has organized an English company with a capital stock of $175,000, to handle his engineering specialties throughout Great Britain and Europe. It is only three years since the McNab indicator was first introduced in the United States, and today over 3,000 of these instruments are in daily operation on vessels ranging from tug boats to battleships.

It is understood that the North German Lloyd, which is the only shipping company in the world which owns and maintains an experimental tank for the purpose of its research work, is about to construct a new tank of similar lines, but with a length of 900 ft. or approximately twice the length of the existing tank.

The Griscom-Russell Co., New York, has secured the American rights for the Sterling Destructor, which is an English high temperature furnace for the disposal of all municipal refuse and industrial waste.

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

LEAVING DOCK AT NEW YORK

Some Random Observations on a Trip to Panama

THE UBIQUITOUS BRITISH TRAMP

THE exodus to Panama at present is world wide, but it is naturally from the United States that the stream of humanity is greatest. The canal zone today combines a pleasant outing with the most tremendous constructive spectacle to be seen in the world. Tourists are pouring into Colon by the ship load almost every day, and with the way they are shot across the Isthmus and through the dining room of the Hotel Tivoli and back again to the boat is a caution to behold. They get a glimpse of the canal where is is crossed by the Panama railroad or is contiguous to it, and that's about all.

The only way to see the canal is to spend a week or ten days in doing nothing else. The real way to see it is to walk through the great Culebra cut and through the giant locks, their culverts and laterals. Here will be found plenty of elbow room; a railway train could be driven through culverts in the side and center walls and an automobile could travel through the laterals quite easily.

The Panama Railroad Steamship Line, which is owned by the Isthmian canal commission, operates a fleet of six excellent steamers between New York and Colon, carrying supplies and provisions to the zone. They have accommodations for a limited number of first-class passengers and take very good care of them indeed. The two most popular boats with the passengers are the Ancon and Cristobal, formerly the Shawmut and Tremont, of the Boston Towboat Co.'s fleet. These vessels were built purely as freight carriers by the Maryland Steel Co., in 1902, for the Boston Steamship Co., and were put in service between Tacoma and the Orient. Two years later it was found advantageous to incorporate passenger accommodations into them and the work was done by the Moran Bros. Co., Seattle, Wash. In altering them the pilot house was built on top of the original wheel house, the wheel house in turn being fitted up as quarters for the captain. His original quarters were transferred into passenger accommodations.

There are two sets of quarters for the first-class passengers on these steamers, one in the forward house under the wheel house and surrounded by the bridge decks; the other in the midship house. In the forward passenger quarters is located the social hall. The dining room is located in the extreme after part of the midship house and extends full width of the promenade deck, having light on three sides. The staterooms are quite spacious and airy, special attention being given to lighting, ventilation and accessibility of baths. These two steamers are 505 ft. over all, 488 ft. between perpendiculars, 58 ft. beam molded, 22 ft. depth molded to main deck, and 32 ft. to upper deck. At the low draught of 27 ft. their displacement is 16,950 tons and they are very steady ships in a seaway. They make the run from New York to Colon in seven days.

The vessel in the fleet, however, that a sailor and one fond of the water would be fondest of is the Advance. She is an iron ship built by John Roach, at Chester, Pa., in 1883, for the Brazilian Navigation Co., and as vessels go nowadays, is a little bit of a thing only 295 ft. long, 38 ft. beam and 23 ft. deep, and of 2,605 tons gross register. She is the same ship today that she was when John Roach turned her out except in minor machinery installations, such as the substitution of a piston valve in place of the sliding valve on the high pressure cylinder, doing away with the riding cut-off and unnecessary friction, and also internal lubrication. These alterations were made by P. H. O'Day & Son, 253 South street, New York. About four months ago a new propeller shaft and wheel were also installed on her. Her engines are compound, 37 and 66 in. diameter by 54 in. stroke, supplied with steam from two Scotch boilers, 10 ft. 3 in. long and 15 ft. diameter, fitted with six furnaces and Howden forced draft, allowed 100 lb. steam pressure. The Advance rides the water like a duck. In a moderate sea and wind she heels slightly like a sailing ship, but never rolls and she will go through fairly heavy weather as dry as a bone. She rarely ships a sea and is an uncommonly delightful ship to sail on, if one does not mind an easy movement in a fore and aft directon.

The chief engineer of the Advance, L. Nickl, has had a varied career in all parts of the world. He was born in Germany and left home when 12 years old to seek his fortune. His first employment was in a machine shop in Nauoetting, Bavaria, where he served an apprenticeship. He came to the United States when 16 years old, working in machine shops for a while, and then returned to Germany, finding employment in Munich. He began his sailing career when 19 years of age in English vessels trading to the East Indies. He returned to the United States in 1890 and shipped as fireman on the steamer City of Washington of the Ward Line, quitting that job later to go as fireman on the steamer Louisiana of the Cromwell Line. He then returned to the Ward Line as oiler and watertender on the steamer Summit. He obtained his license in 1899 and went as assistant engineer on the steamer Saratoga, of the Ward Line.

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

After serving as second assistant engineer on the Monterey and first assistant on the Mexico, he left the Ward Line and joined the American-Hawaiian Steamship Line, serving as second assistant on the Hawaiian and first assistant on the Oregonian. Five years ago he joined the Panama Railroad Steamship Line as first assistant on the Panama, and three years ago was promoted to chief engineer of the Advance. In his early days while sailing to the East Indies he unconsciously gave his landlady quite a fright. He had shipped on the Tiber, lying at the Barry docks, at Cardiff, but was somewhat delayed in reaching the vessel from his lodgings, with the result that she sailed without him. He then shipped on the steamer Westergate for Port Said and had quite a time with her in the Mediterranean, as part of her machinery broke down. Returning later to the home port to his old lodging he learned that the Tiber had foundered with all hands.

Life in Colon and Panama City is a strange mixture of the occidental, Oriental and medieval. All nations are jumbled together, Chinese, Hindoos, Panamanians, Americans and negroes, the negroes for the time being vastly predominating, as the manual work on the canal is largely being done by them. The people of Spanish descent that one encounters in the Isthmus are not an impressive lot. In fact, the best types of Spanish manhood that I saw were in the stokehold of the Ancon. They were stalwart fellows of unmixed Spanish blood, and Chief Engineer Coleman reported them to be excellent workmen. There will probably be an influx of Spanish firemen to the lakes in the spring as some of the coastwise lines are putting in oil burners. Their advent in the lake region will be welcome if the average is anything like the stokehold force of the Ancon.

The Isthmus will unquestionably become, in a very little while, one of the chief winter resorts for the people of the United States. There is every reason why it should be so. The Isthmus is the tropics—but the tropics supplied with bath tubs and all modern conveniences—the tropics where the exotic becomes the indigenous, where orchids bloom in the open air, where palms in a bewildering variety of form are to be seen everywhere, where strange trees bloom at all seasons and where a luxurious languor seems to possess all things animate. The colors of life are very vivid and to one accustomed only to the cold, gray light of the north

J. H. FLETCHER, purser; L. NICKL, chief engineer; G. H. CANTWELL, surgeon
OF THE S. S. ADVANCE

are, for the time being at least, fascinating. No hotel could be better situated than the Tivoli at Ancon. It stands upon a hill and from its porches one may see the broad expanse of the Pacific, always placid and unruffled, with the sun rising out of it like a golden ball and the fishing smacks coming in with their morning catch. At Colon, too, the Isthmian Canal Commission is building a hotel, to be known as the Washington, right on the beach, separated from the ocean only by a driveway. A concrete wall, at least 8 feet high, surrounds the hotel and in the enclosure an enormous salt water swimming pool is being constructed for the use of the guests. Enough said.

The commander of the Advance is Capt. J. J. Clarke, a careful navigator, ably assisted by A. T. Musselwhite, chief officer; F. O'Neil, second officer, and C. H. Sargent, third officer. The watches on this steamer for the lack of an additional officer are four hours on and four hours off. The officers complain that the system does not give them sufficient consecutive sleep. The Hardy bill, just passed by Congress, will remedy this state of affairs by practically putting the forward watch on an eight-hour basis.

J. H. Fletcher, purser on the Advance, was employed in the purser's department of the Republic when she was struck by the Florida and sunk. He speaks in the highest terms of Capt. Sealby's conduct upon that occasion. Immediately after the blow, Capt. Sealby met all the passengers in the main companionway, told them that there was no immediate danger, that he had sent his chief officer to inquire into the extent of the colliding steamers' injuries, that the lifeboats were hanging outboard on the davits and that everything was in readiness for transfer upon the chief officer's return. As known, all the passengers were safely transferred to the Florida. The boats were hoisted and swung outboard again upon the davits. After the stewards had served a standing lunch, Capt. Sealby said:

"Gentlemen, there are the boats. You are all at liberty to go."

Not a soul stirred and the captain was obliged to order them into the boats. Meanwhile, Jack Binns was guiding the Baltic through the black fog with wireless advices and the White Star line were rushing tugs from New York to the scene of the wreck. The successful transfer of the passengers from the Florida to the Baltic is, of course, well known. Capt. Sealby declined to leave his vessel. She stayed up for thirty-eight hours after the collision and he was picked up out of the water on some floating wreckage after she went down.

The Caribbean is a sapphire sea, quite phosphorescent at night and filled with flying fish by day. These little creatures, scarcely bigger than sardines, fly for considerable distances, sometimes as much as 200 ft. or so. One that flew aboard the Ancon was about 14 in. long and had fins, webbed, about as large as the wings of a robin. There were plenty of Portuguese men-of-war to be seen, too. These curious little fish have a film which they inflate and extend above the water's edge, much like a sail, and the wind catching it blows them along. The film is heliotrope in color and very conspicuous against the blue water. There were plenty of porpoises to be seen. One whale was also sighted spouting in the distance, but he only showed his big, black body once.

The Ancon is commanded by Capt. G. E. Sukeforth, an extremely efficient officer. On this steamer the officers have watches of four hours on and eight hours off and are well pleased with the arrangement, believing it to be the only satisfactory system for deep sea sailing. A. J. Colard is chief officer, J. E. Stone, second officer, F. P. Drugon, purser and J. A. Winter, surgeon. They are all extremely pleasant and obliging, making the passage very enjoyable.

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

THE MARINE REVIEW

DEVOTED TO MARINE ENGINEERING, SHIP BUILDING AND ALLIED INDUSTRIES

Published Monthly by

The Penton Publishing Company

Penton Building, Cleveland.

CHICAGO - - - - - - - 1328 Monadock Blk
CINCINNATI - - - - - - - 503 Mercantile Library Bldg
NEW YORK - - - - - - - 1115 West Street Bldg
PITTSBURGH - - - - - - - 2148-49 Oliver Bldg
WASHINGTON, D. C. - - - - - - Hibbs Bldg
BIRMINGHAM, ENG. - - - - - Prince Chambers

Subscription, $2 delivered free anywhere in the world.
Single copies, 20 cents. Back numbers over three months, 50 cents.

Change of advertising copy must reach this office on or before the first of each month.

The Cleveland News Co. will supply the trade with THE MARINE REVIEW through the regular channels of the American News Co.

European Agents, The International News Company, Breams Building, Chancery Lane, London, E. C., England.

Entered at the Post Office at Cleveland, Ohio, as Second Class Matter.

(Copyright 1913, by Penton Publishing Company)

March, 1913

The Towing Company's Case

The Great Lakes Towing Co., in pursuance of the recent order of the federal court has, through its attorneys, submitted to the court a plan of reorganization doing away with the administrative practices complained of by the government agents. The plan was submitted to Judge Warrington, of Cincinnati, recently, but as the government agents were without instruction from Washington in the premises, the matter was postponed. In the outline of the plant as submitted the company agrees to discontinue all form of practices which might seek to restrain trade and to publish a tariff for each port, treating each port as a unit and not seeking to influence the business of one port through any trade connections with another. The company, however, desired the right to make season contracts for each port. The whole matter is in something of a tangle at present because navigation will be opened in a month or more and vessels will certainly have to be towed in and out of port as usual.

The Seamen's Bill Vetoed

President Taft killed the seamen's bill by administering to it a so-called pocket veto, that is to say, he did not sign it and, therefore, made it non-effective. His reasons for doing so were very sensible. He said that in the short time which remained before his retirement from office he could not give it the consideration which it deserved and, therefore, was reluctant to assume the responsibility of its becoming law. This action on the part of President Taft is heartily approved, as the measure would have worked a great hardship to a number of vessel owners. It would have increased the operating expenses of lake freighters materially and would have made necessary the construction of additional deck-houses to house the new members which the bill would have added to the crew.

The Panama Canal

Let no one think that the Panama canal presents any constructive problem that cannot be met. It is only a question of keeping on digging. Considerable more earth will have to be removed from the cut than was originally contemplated, but perseverance will remove it. Vessels may not go through as soon as was hoped, but they will certainly be going through before the official date of the opening, Jan. 1, 1915. The recent slides in the Culebra cut have been very severe and to the casual observer doubtless very discouraging, but to the engineer they are a very simple problem. The recent slide at Cucaracha on the southern slope of Gold Hill in the Culebra cut was very severe, nearly 3,000,000 tons of earth sliding back into the basin and burying all of the tracks with the exception of one track on the topmost level. There will probably be further slides at this point when this particular one is removed, but constant digging will doubtless eventually remove them all.

There is also another kind of slide occurring in the cut, and that is the one caused by pressure. In this case the bottom of the canal is pushed up by the enormous weight of the sides, which are, of course, now without lateral support. At Culebra itself over 7,000,000 tons of earth have gone back into the excavated section from this cause. The cut through the continental divide is 500 ft. deep at the highest point, and it may be that before the slides cease a considerable part of the mountain will have to be removed. In fact, steam shovels are now working to take off the top weight and it may be necessary to maintain dredges at this point for years to remove material as it slides in. There is a possibility that navigation may at some time be arrested at this point by this very circumstance. The Culebra cut is nine miles long and pictures give a very inadequate expression to the enormous character of the excavation. The canal is dyked at the entrance to the cut and the Chagres river is flowing into the balance of it, forming a lake extending from the dyke to the dam at Gatun. This dam is really one of the wonders of the canal. It is located at the only point in the Chagres valley where an opening exists in the range of mountains surrounding it and what has actually been done has been to build a mountain at this point with the material excavated at Culebra. In other words, a mountain has been removed at Culebra and a mountain built at Gatun.

In the way of concrete construction little remains to be done. The only important concrete work un-

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

finished is the approach or guide-wall in the Atlantic sea level section at Gatun.

Gatun lake is, of course, the mill pond of the canal. From it all the water must be obtained for the lockages. Elaborate calculations have been made of rain fall, evaporation and seepage, and it is believed that the lake will have a sufficient amount of water to make 58 lockages a day during the dry season.

As a commercial proposition the canal may for some years be found to be a disappointment; but as a means of naval defense, it is of prime importance.

Eight Hour Day for Dredges

The bill fixing eight hours as the maximum day for dredge workers employed on government contracts was signed by President Taft just before his term expired. The bill was called back by joint resolution of the house after it had passed both house and senate because it was feared its enactment would repeal the general eight-hour work-day law of 1892. Having been reassured on this point, the house returned the bill to the president. The measure will not affect existing contracts which will be carried out under their original terms, but all future bids for government dredge work will be based upon an eight-hour day. Obviously the bids will have to be increased.

Sir William Henry White

Sir William Henry White, commonly acknowledged to be the world's foremost naval architect, died suddenly in London, on Feb. 27, after a stroke of apoplexy. The loss of this noted man will be felt by his profession, as he was in the prime of his productivity in enriching the literature of naval architecture. He was in every sense of the word a self-made man, acquiring his vast experience in the school of hard knocks. Born in Devonport in 1845, he served his apprenticeship in a ship yard and entered the constructive department of the admiralty in 1867, remaining there until 1883, rising meanwhile to the rank of chief constructor. He organized and directed the war ship building department of Armstrong & Co., Newcastle, from 1883 to 1885. He was a director of naval construction and assistant controller of the Royal navy from 1885 to 1902, during which period he originated the so-called dreadnaught type of fighting ship.

This period was one of enormous activity, as it practically meant the evolution of the world's greatest navy, and his health broke down over the strain. He was awarded a special grant of money by vote of parliament in recognition of his services to the navy. Since his retirement in 1902 his services were in constant demand as consulting designer and he had a very large share in designing the Cunard liner Mauretania, which is generally admitted to be the finest merchant ship afloat. He was a member of many naval and engineering societies and a most voluminous writer. His latest visit to the United States was in November, 1911, to receive the John Fritz medal for distinguished services in engineering, which was bestowed upon him at the annual dinner of the Society of Naval Architects and Marine Engineers, at the Waldorf-Astoria, New York.

Actions Louder Than Words

In a letter to the New York *Times*, Mr. Meyer, now ex-secretary of the navy, refers to the work that he did for the fleet and recommends that "to reduce expenditures needless navy yards should be abolished and sold." This leads Rear Admiral C. F. Goodrich quite pertinently to inquire why Mr. Meyer's earliest official act was to reopen two such yards which his predecessor, Mr. Newberry, had closed? A great many are also disposed to make the same inquiry. Actions speak louder than words. Had Mr. Newberry's plans been carried out, the navy department would be a more efficient organization than it is today. Continuing with his observations, Admiral Goodrich says:

"On assuming office Mr. Meyer found a navy yard organization which, however imperfect in detail, was at least a logical effort to adopt modern methods and to secure prompt and economical results. In this system the independent inspections he justly holds to be so important were assigned to the officers for whom work and repairs were to be executed. His predecessor had not overlooked this essential consideration, which Mr. Meyer's remarks seem to imply as originating with him. Instead of remedying the defects in Mr. Newberry's scheme, he proceeded without delay or adequate trial to smite it hip and thigh, substituting in its place an organization which is bound to go to pieces at the first breath of war.

"That sea-going officers should learn all they can about shop practice was well known and universally admitted before Mr. Meyer. The discovery is not his. Whether this knowledge may not be better acquired by well-regulated schooling in establishments that are recognized as thoroughly up-to-date than in ostensibly superintending molders, founders, patternmakers, machinists, carpenters and what-not is at least open to argument. Officers are ordered to this shore duty as a routine matter. They bring to it zeal, intelligence and the very highest ideals of integrity and loyalty, but, with hardly any exception, they lack the trained experience and the intimate acquaintance with the skilled workman's wily ways which complete the list of the qualities necessary to modern efficiency in a manager. It is not fair to judge them too harshly by their economic results, nor is it possible to estimate the cost to the nation of Mr. Meyer's erroneous notions as to the industrial education of sea-going officers. Since this authoritative estimate is not available, one opinion is as good as another. Many believe the showing would prove most discouraging. A becoming modesty might suggest the inadvisability of claiming credit in a case where so much doubt exists."

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

Discipline On Board Ship

Annual Meeting of the Cleveland-Cliffs Iron Co.'s Masters and Officials

AT THE annual meeting of the masters and officials of the Cleveland-Cliffs Iron Co., which was held on Feb. 20 and 21, at the company's offices in Cleveland, addresses were made by J. H. Sheadle, manager, and Hermon A. Kelley, general counsel. Prizes were distributed to the mates for upkeep of ship, W. G. Cousins of the steamer W. G. Mather, getting the first prize and C. O. Rydholm, of the steamer Angeline, the second prize, for class A steamers. For the class B steamers, C. Anderson, of the steamer Andaste, got the first prize and W. Amsbury, of the steamer Cadillac, the second prize. The following were the conditions observed in awarding the prizes:

General exterior appearance of ship during running time; general order and condition of equipment; degree of absence of rust in every part of the ship; general discipline and changes in crew during season; amount of scraping and painting to be done when ship comes in at end of season.

Capt. G. A. Lyons read a paper on "The Risks of Navigation," Capt. P. A. Anderson on "Purchase of Ship Supplies," Capt. R. A. Gaskin on "Some Thoughts on the Upkeep of the Ship" and Capt. W. T. Mooney on "Discipline on Board and How Best Obtained."

Capt. Mooney's address was as follows:

Discipline on Board Ship

We all know that no successful business or enterprise of any kind can be run without discipline.

Discipline is the keynote of system. The advantages of doing work systematically are many. Work that at first seems a hardship becomes easy when men are trained thoroughly; but without discipline things run in haphazard fashion.

After the usual routine of fitting out has been done, and the first available opportunity presents itself, I have the mates come into my room and I talk to them on the management of the crew and everything pertaining to the running of the ship. I gather from them their ideas and together we lay plans for obtaining and enforcing discipline aboard the boat and running everything systematically. I emphasize the fact that our crew must be treated well, that each member must be made to feel that he is of some importance in the management of the ship, and every one must be given a chance to make good. No personal feeling should influence our judgment in dealing with any one of the crew and every man should always be given the benefit of the doubt.

One point that I always try to impress strongly on their minds is the importance of telling the truth about any affair when anyone gets into difficulties, no matter who it hits. This policy is a good one in maintaining discipline and getting the men to confide in you. It is easy enough to lay down a rule to enforce discipline but you must have the actual co-operation of your officers in enforcing it.

Daily Inspection of Ship

A master should fortify himself by getting the absolute confidence of his men and they in turn must have confidence in him. By being firm and considerate in all dealings with your men and guiding them against errors in the little things you will find them taking care of the more important matters, and with some pride, too.

One of the best ways to enforce discipline, I believe, is the master's daily inspection of the ship. It will not be long before the men look for this inspection, and it tends to make them more careful in their work and to have their rooms and lockers in order.

Frequently a man will be seen to step over a broom, or stumble over a heaving line, and go on without picking either of them up. By drawing his attention to the fact that it is an easy matter to pick up such articles, and letting him know that it is policy for him to do so, he will get into the habit of picking up tools, etc., lying around the deck, and putting them in their proper places. It is this "getting the habit" that counts, and it requires discipline to establish it.

I have always found that good results are obtained from commending the men occasionally for some good work they have done. It encourages them in their work, and without any doubt, if that particular work is to be done over again, it will be done better than before. Constant nagging causes a man to lose respect for the master and, like disease, disrespect spreads among the rest of the crew and one may then look for breaches of discipline.

The officers should see that all work and orders are carried out promptly and with care by their subordinates, for the successful handling and managing of a ship depends on their obedience to their superior officers.

One good result of discipline is the prompt handling of the ship at the loading or unloading docks. The men are always on the job and no time is lost making shifts by having to hunt from one end of the boat to the other for the men to stand by their lines.

If one has to censure any member of the crew for an error committed he should wait until the affair has quieted down and then quietly call him aside. "Even the best natured man should not be directed contrary to his habits when he is under stress." We should try and make him feel that it is for his own special good that he is being corrected; that if he was not the kind of man we wanted, we would not take the trouble and time to correct him, but would look for new material to fill his place. Such a course will create a better feeling in the man—the master will make a friend of him and he will become a more energetic worker and do his best to make good. Therefore it is for the master to be kind and courteous to his crew, if he treats them with respect they will respect him. A man who shows ability should be given a chance to develop.

Diplomacy in Reprimanding

I have in mind two rules that have helped out occasionally. They are: "Success depends more on the man than on the plan," and "Keep an eye to your own affairs, for a master's eye is worth ten hands."

Cramps, Philadelphia, have received contracts to build two steamers for service between the Atlantic and Pacific coasts, via the Panama canal. The vessels will be of the highest type of trans-Atlantic passenger ship and will cost about $2,500,000 each.

The senate committee on interoceanic canals voted to table Senator Root's bill to repeal the provision of the Panama canal bill granting free toll to vessels engaged in the domestic trade of the United States.

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

Oil Fuel for Steamships

The Advantages That it Possesses Over Coal Both for Warships and the Merchant Marine

By J J Kermode

THE advocates of liquid fuel, as compared with solid fuel, have had an up-hill fight. They have had to maintain the great economic advantages of petroleum for fuel in the face of its higher price The two points are entirely distinct. The economic compensations offered by liquid fuel are so many that a higher price can be allowed, and in many cases there is no excess of actual money cost against it. Coal is, under any conditions, a dirty, wasteful, and variable means of raising steam and providing power. Its quality varies so enormously that its wastefulness is not always appreciated to its full extent. There are a number of constituents which are not at all necessary to the provision of heat; they are injurious to boilers and furnaces and harmful to individuals working them. Coal is costly to handle, and entails a lot of unnecessary work in use. The vast difference between liquid fuel and coal is no more graphically seen than in the bunkering of a vessel with coal and loading up with oil fuel. It is typical of the two descriptions of fuel—the one the embodiment of clumsiness and uncleanliness, the other clean, easy, and efficient. With such a vital thing as fuel—the basis of all trade, industry, and commerce—the change from coal to oil fuel may be slow, though it need not be conservative, and with a wider knowledge of the many advantages which the use of liquid fuel offers, especially in industrial process work, we may look for a wider adoption of oil fuel, and for many improvements in the design of boilers and industrial furnaces which will insure the best results. The sources of supply are every day becoming greater in number, and several oil companies are making extensive arrangements to facilitate cheap transport, ample storage, and fair prices to meet the undoubted growing demand for the commodity in this country.

Romantic History of Oil Industry.

One of the romances of industry is the history of oil. Originally a natural curiosity sold in ounces for special uses, it has now an annual world production, in crude oil, of probably more than 45,000,000 tons, an output that is increasing largely every year. Great as is this output, almost unlimited reserves of oil exist both in the present known oil areas and in regions that are at the moment comparatively inaccessible. In its earlier development oil was used mainly as an illuminant. Today, the future of oil lies in its extended use as fuel. Improvements in the methods of treating crude oil have enabled the chemist and the engineer, in combination, to obtain from the natural product not only illuminants, but benzines, naphthat and petrol, and lubricating oils, fuel oils, paraffine wax, and a host of valuable by-products.

The search for the raw material of these valuable commercial products is being conducted with capital, enterprise, and all the resources of science, in wise anticipation of the great future that is before oil in the transport and manufacturing world. Navies, railways, industries, are all clamoring for oil. It is recognized that while the demand is making the supply, supply is increasing the demand. That is why the American output of oil has doubled within two years; why Maikop is being drilled into innumerable wells; why India, Egypt, South and West Africa, Australia and New Zealand, Canada, Peru, the Argentine, Sakhalin in the Far East, and Roumania in the Near East, Trinidad and Barbadoes in the West Indies, and Borneo in the East Indies, are all being increasingly tapped for oil, and why capital and energy are multiplying the wells of California, Texas and Mexico at a great rate.

The Navy and Oil

Though the utility and economy of oil for fuel purposes generally have in the last few years been recognized, it was the announcement that the British navy was adopting it that struck the popular imagination and directly induced the oil boom. Beginning with the experiments, conducted for the admiralty by the writer in 1902, the British naval authorities have been converted to the new policy. Briefly repeated, the superiority of oil over coal for battleships is the greater mobility of the vessel, smokeless when it is essential that a warship shall approach or slip away unobserved, rapid development of speed, the "nursing" of the stokers, who would be absolutely exhausted through stoking coal in a long fight, the keeping qualities of the fuel, and last but not least, the extraordinary facility with which oil may be "bunkered" in mid-ocean in any weather by the use of a hose connection between the tank vessel and the warship. That the admiralty is convinced on these points is sufficiently demonstrated by the fact that every battleship built in the last few years, now building, or merely projected, uses oil as auxiliary to coal. Of the bigger completed warships of the British navy, which have been equipped for auxiliary oil fuel may be mentioned the Defence, Bellerophon, Temeraire, Vanguard, Invincible, Superb, St. Vincent and Collingwood, all vessels of from 18,500 to 19,250 tons. The super-Dreadnoughts of the future are also designed with the same purpose. Of destroyers, good types of the latest oil-fired vessels are the Swift, an ocean-going destroyer, which can steam from 1,500 to 1,700 miles without re-oiling, and the fastest warship in the world; and the Nubian, the latest of the oil-fired 33-knot destroyers, which are to include the Crusader, Zulu, Maori and Viking, all in the builders' hands. All of these vessels are equipped with the Kermode system.

For Liners and Railways

Apart from the fighting oil-fired steamers, however, oil is coming for the ordinary mercantile marine. Probably for a very long time coal and oil will both be used, the two systems being alternative on each vessel, as in the case of the warships. The fact that from Port Said to Yokohama it is now possible to re-fuel a ship with oil is an inducement to eastward-bound shipping to adopt the cheaper and cleaner method.

In the case of steamships the advantages may be enumerated thus: Steady steam, fires never dirty and no fires to clean, consequently no tube cleaning. From the effect of dirty fires and boiler tubes, fouled with soot and ashes, quite 12½ per cent of steam is lost upon a voyage between points seven days apart. The loss of speed is, therefore, considerable. Reduction of bunker space to about five-eighths that required for coal. Reduction in the number of hands in the fire-room department, as the apparatus is automatic in action, and one man can attend to several boilers. Those portions of a ship which are now useless for coal-bunker purposes, through their narrowness or position, are always available for the storage of oil fuel. In this way, the double-bottom can be

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

used, and the trim of the ship can be preserved by the admission of sea water to the emptied oil tank. There need be no such thing as a list to port or starboard through being obliged to use fuel out of one bunker more than another. A steam pump will readily remove oil fuel from port to starboard, or vice-versa, when the same expedient is impossible with coal.

The bunkering of the largest ship can be effected cleanly and silently in a few hours, as hundreds of tons of fuel can be pumped into the bunkers in an hour.

There is no smoke, even when steaming at full speed, the fires can be checked instantly if the engines are slowed and quickened again as instantly to meet the quicker speed of engine.

All boilers, of whatever type, are available for the use of liquid fuel without any modification in the arrangement of furnace as used for coal, except in some special cases. The difficult problem of bunkering a warship at sea is got over at once if oil fuel be substituted for coal.

Steamer Isabella J. Boyce and Tow

The accompanying photograph is that of a scene common on the lakes at one time, but now uncommon. It shows the steamer Isabella J. Boyce with the barges, John J. Barlum, Iron Cliff and Unadilla, in tow, going up the St. Clair river. This fleet is owned by the Pringle Barge Line, St. Clair, Mich., though since the photograph was taken, the Unadilla has been replaced by the Golden Age. The Barlum was recently modernized by the Wolverine Dry Dock at Port Huron, giving her 13 hatches, spaced 12 ft. centers. The Iron Cliff's 24-ft. center hatches have also been extended in a fore and aft direction. The vessels carry coal to the plant of the Diamond Crystal Salt Co. at St. Clair, Mich., the dock being equipped with a 2-ton Williams clam shell bucket.

Marine Engineering Academy

The Marine Engineering Academy, 80 Broad street, New York, established in 1904 by Thomas H. Barrett and later taken over by Theo. T. Mercereau, under whom more than 700 men were trained to become marine engineers, has been purchased by the educational department of the West Side Y. M. C. A. According to Mr. Mercereau, the academy is unique in its field, there being no other school like it in the country.

The Young Men's Christian Association has taken up the work of training men to become marine engineers not solely upon the advice of men who have had experience in this particular phase of education, but also upon the counsel of prominent steamship men, who have welcomed the event of reorganizing and continuing the academy, as a means through which they may secure more efficient and better trained engineers.

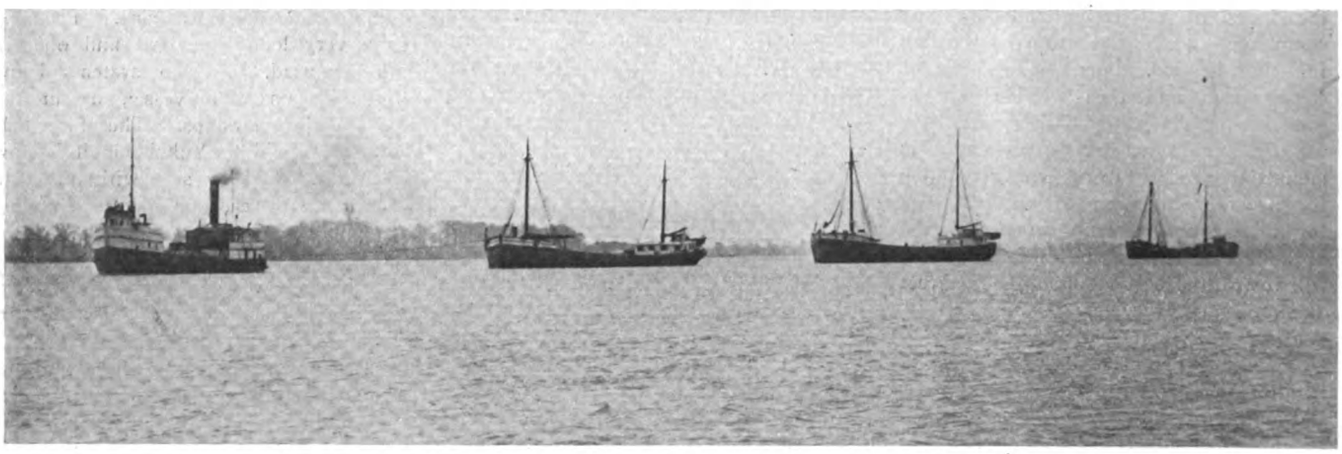
The Y. M. C. A. will strive to make it easier for men to secure their license, by a thorough course planned to meet the difficulties most often encountered by candidates. They will cater not only to local patronage, but to the future engineers of the entire country. Through investigation they have found that there are men the country over who do not want to come up for an examination, because they feel that there is some requirement, such as mathematics, which they would not be able to pass, and they are unwilling to place themselves in a position to be humiliated by failure. They will be given the needed instructions along the line of the questions asked, and will be coached in the proper manner of going about securing their licenses. The course planned deals exhaustively and thoroughly with the various mathemetical calculations marine engineers are called upon to make.

Mr. Mercereau will remain with the school in the capacity of adviser, and John L. Moran will be the instructor in the new course.

The advisory committee consists of Robert E. Todd, ex-commodore Atlantic Yacht Club; Arthur Curtis James, ex-commodore New York Yacht Club; Capt. George S. Runk, member Larchmont Yacht Club; and Edward L. Wertheim, educational director of the West Side Y. M. C. A.

Wilson Seamen's Bill Vetoed

The Wilson seamen's bill, which passed the senate in the closing hours of the session, was vetoed by President Taft upon Senator Burton's advice. President Taft very sensibly felt that in the short time allotted to him in considering the measure before his term expired that he could not give it the consideration which it deserved and therefore did not feel justified in assuming the responsibility of allowing it to become law. If the measure had become law in the form in which it was passed, it would have materially increased the operating expenses of lake vessels as it practically meant adding about 33 per cent to the number of the crew. Anyone at all familiar with conditions aboard lake ships knows that the crew is not overworked. The officers are occasionally overworked, but the crew certainly have ample time to recuperate from any extra work they may be called upon to do in port.



THE STEAMER ISABELLA J. BOYCE WITH THE SCHOONERS JOHN J. BARLUM, IRON CLIFF AND UNADILLA IN TOW GOING UP THE ST. CLAIR RIVER

A state appropriation of $50,000,000 for the improvement of Boston harbor has been requested by the director of the port of Boston.

Naval contractor Richard H. Robinson has resigned from the navy department, to take a position with the Lake Torpedo Boat Co., Bridgeport, Conn.

Generated on 2024-07-25 21:56 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

Average Lake Freight Rate

There is appended herewith the usual annual summary of freight rates on the great lakes for the season of 1912. The ore rate was cut 10 cents at the opening of the season, making it 50 cents from the head of the lakes, 45 cents from Marquette and 35 cents from Escanaba. The unloading charge, however, which is borne by the vessel, was reduced from 15 cents to 10 cents, making the net reduction in the freight rate 5 cents. The coal rate to Lake Michigan was established at 30 cents, a reduction of 5 cents from the rate paid during the preceding year, which sum was paid to all ports, as nearly all the ports on Lake Michigan are now equipped with fast plants. The lumber rate worked out at a better figure than has been paid since 1899, averaging $2.76 per 1,000 ft.

A veritable harvest, however, was reaped in grain. The average rate per bushel from Duluth to Buffalo was 2.01 cents and from Chicago to Buffalo, 1.39 cents. The opening rate on grain from the head of the lakes was 1⅝ cents, suffering a temporary decline during a portion of July and August to 1⅛ cents, but sharply increasing as the season advanced, the common rate being 2½ cents throughout the fall months with 3½, 4 and 5 cents paid on final cargoes. Vessel owners who were free to enter this trade reaped a rich harvest.

While the great bulk of the ore, of course, was carried at the contract rate, the smaller shippers, beginning with September, were obliged to pay an advance of 10 cents in order to get vessel capacity. The demand for ships ruled firm throughout the year and the season, altogether, was quite profitable to the vessel owner, due, of course, largely to the very heavy grain movement. Were it not for the fine support given to the trade by grain the season would not have been especially profitable. Following is the summary of rates:

AVERAGE DAILY FREIGHT RATES 10 YEARS, ENDING WITH 1912.

	Cents.
Iron ore, head of Lake Superior to Ohio ports, gross ton	69
Iron ore, Marquette to Ohio ports, gross ton	63
Iron ore, Escanaba to Ohio ports, gross ton	53½
Soft coal, Ohio ports to Milwaukee, net ton	40
Soft coal, Ohio ports to Duluth, net ton	33
Hard coal, Buffalo to Chicago, net ton	41
Hard coal, Buffalo to Duluth, net ton	32½
Wheat, Chicago to Buffalo, bu.	1.42
Wheat, Duluth to Buffalo, bu.	1.75
Lumber, head of lakes to Ohio ports.	2.56

AVERAGE LUMBER RATES, DULUTH TO LAKE ERIE PORTS.

1912	$2.76	1905	$2.45
1911	2.60	1904	2.54
1910	2.34	1903	2.57
1909	2.40	1902	2.54
1908	2.61	1901	2.66
1907	2.58	1900	2.33
1906	2.71	1899	3.08

AVERAGE FREIGHT RATE ON IRON ORE PER GROSS TON FROM PORTS NAMED TO OHIO PORTS—TABLE COVERING WILD AND CONTRACT RATES FOR 20 YEARS PAST.

	Escanaba.		Marquette.		Ashland and other ports at head of Lake Super'r.	
	Wild or daily rate.	Con-tract rate.	Wild or daily rate.	Con-tract rate.	Wild or daily rate.	Con-tract rate.
1893	0.56	0.85	0.71	1.00	0.77	1.00
1894	0.46	0.60	0.60	0.80	0.78	0.80
1895	0.73	0.55	0.92	0.75	1.13	0.80
1896	0.52	0.70	0.66	0.95	0.77	1.05
1897	0.45	0.45	0.55	0.65	0.57	0.70
1898	0.51	0.45	0.60	0.60	0.62	0.60
1899	0.95	0.50	1.08	0.60	1.29½	0.60
1900	0.69½	1.00	0.78½	1.10	0.84½	1.25
1901	0.64	0.60	0.79	0.70	0.89	0.80
1902	0.59	0.60	0.66	0.70	0.77	0.75
1903	0.61	0.65	0.72	0.75	0.81	0.85
1904	0.53½	0.55	0.62	0.60	0.70	0.70
1905	0.61	0.60	0.70	0.70	0.77	0.75
1906	0.60	0.60	0.70	0.70	0.7555	0.75
1907	0.60	0.60	0.70	0.70	0.75	0.75
1908	0.50	0.50	0.60	0.60	0.65	0.65
1909	0.52	0.50	0.61	0.60	0.66	0.65
1910	0.55	0.55	0.65	0.65	0.70	0.70
1911	0.45	0.45	0.55	0.55	0.60	0.60
1912	0.39	0.35	0.49	0.45	0.54	0.50

Charge to vessel in 1912 for unloading iron ore was 10 cents per ton. The wooden vessels that required trimming paid an additional charge of about 3 cents per ton for that service.

Average ore rates for the entire period of 20 years: Escanaba, wild 57 cents; contract 58 cents; Marquette, wild 68 cents, contract 70½ cents; Ashland and other ports at the head of Lake Superior, wild 76½ cents, contract 76 cents.

Average for past 10 years: Escanaba, wild 53½ cents, contract 53½ cents; Marquette, wild 63 cents, contract 63 cents; Ashland and other ports at the head of Lake Superior, wild 69 cents, contract, 69 cents.

AVERAGE RATES ON WHEAT PER BUSHEL BY LAKE FROM CHICAGO TO BUFFALO.

Year.	Cents.	Year.	Cents.	Year.	Cents.
1860	9.89	1877	3.72	1895	1.97
1861	11.53	1878	3.07	1896	1.70
1862	10.49	1879	4.74	1897	1.56
1863	7.51	1880	5.75	1898	1.53
1864	9.58	1881	3.44	1899	2.71
1865	9.78	1882	2.50	1900	1.79
1866	12.34	1883	3.41	1901	1.42
1867	6.67	1884	2.18	1902	1.51
1868	7.14	1885	2.02	1903	1.41
1869	6.81	1886	3.68	1904	1.32
1870	5.88	1887	4.13	1905	1.67
1871	7.62	1888	2.56	1906	1.72
1872	11.46	1889	2.51	1907	1.57
1873	7.02	1890	1.96	1908	1.00
1874	4.03	1891	2.38	1909	1.56
1875	3.42	1892	2.38	1910	1.44
1876	2.90	1893	1.66	1911	1.08
		1894	1.27	1912	1.39

Average for 53 years, $4.07.

Charges to vessels for shoveling, trimming and tallying weights of grain amounted to $4.12½ per 1,000 bu. in 1912.

LAKE FREIGHT RATES ON WHEAT, DULUTH TO BUFFALO.

Year.	Rate. Cents.	Year.	Rate. Cents.
1912	2.01		
1911	1.17		
1910	1.33		
1909	1.96		
1908	1.22		
1907	1.86		
1906	2.19		
1905	2.31	1894	1¼ @ 3
1904	1.81	1893	1¼ @ 3½
1903	1.6	1892	2¼ @ 4
1902	1.9	1891	1¾ @ 9½
1901	2.3	1890	2 @ 5
1900	2.0	1889	2 @ 5
1899	3.6	1888	2 @ 5
1898	1.8	1887	2 @ 8
1897	1.75	1886	3¼ @ 8
1896	2.12		
1895	3.50		

Figures for 18 years past average of daily rates for full season; previous to 1895 rates given are highest and lowest of the year.

AVERAGE OF DAILY RATES ON SOFT COAL FROM OHIO PORTS TO MILWAUKEE, ESCANABA, DULUTH, GREEN BAY AND MANITOWOC.

Year.	Milwaukee. Cents.	Escanaba. Cents.	Duluth. Cents.	Green Bay, Cents.	Manitowoc. Cents.
1903	50½	45	41½	50½	46
1904	47	40	37	45½	47
1905	46½	41½	33½	42	41½
1906	46	42	35	42	42
1907	40	35	30	35	35
1908	40	35	30	35	35
1909	37	31	31	32	31
1910	35½	35	31	36	35½
1911	32	31	32	31	31
1912	30	30	30	30	30
Average for 10 years.	40	36½	33	38	37

Chicago rate about same as Milwaukee.

Coal of all kinds shipped in net tons and handled without charge to vessel.

AVERAGE OF DAILY LAKE FREIGHT RATES ON HARD COAL FROM BUFFALO TO CHICAGO, MILWAUKEE AND DULUTH DURING TEN YEARS PAST.

Year.	Chicago. Cents.	Duluth. Cents.
1903	48	38
1904	43	34
1905	44	34
1906	46	35
1907	40	31
1908	40	30
1909	41	32
1910	41	31½
1911	35	30
1912	30	30
Average for 10 years	41	32½

Rate to Milwaukee practically the same as to Chicago.

Hard coal is net tons and is handled without charge to vessel.

AVERAGE DAILY RATES OF FREIGHT ON THE GREAT LAKES.

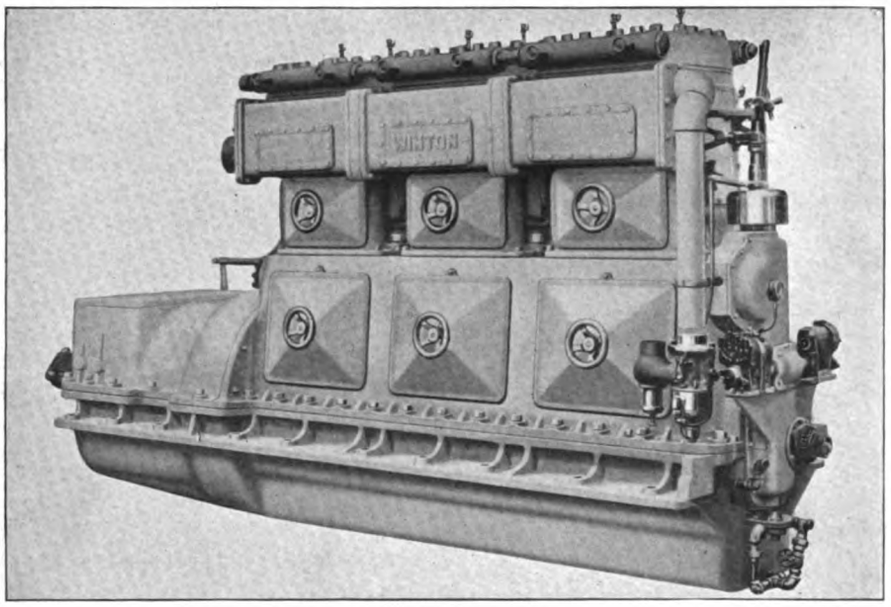
	1910. Cents.	1911. Cents.	1912. Cents.
Iron ore, Escanaba to Ohio ports, gross ton	55.00	45.00	38.72
Iron ore, head of Lake Superior to Ohio ports, gross ton	70.00	60.00	53.72
Iron ore, Marquette to Ohio ports, gross ton	65.00	55.00	48.72
Wheat, Chicago to Buffalo, bu.	1.4485	1.08	1.3936
Wheat, Duluth to Buffalo, bu.	1.3313	1.17	2.0192
Soft coal, Ohio ports to Milwaukee, net ton	35.71	32.00	30.00
Soft coal, Ohio ports to Duluth, net ton	31.07	32.00	30.00
Soft coal, Ohio ports to Portage, net ton	30.61	31.00	30.00
Soft coal, Ohio ports to Manitowoc, net ton	35.61	31.00	30.00
Soft coal, Ohio ports to Sheboygan, net ton	35.61	31.00	30.00
Soft coal, Ohio ports to Green Bay, net ton	36.22	31.00	30.00
Soft coal, Ohio ports to Escanaba, net ton	35.31	31.00	30.00
Hard coal, Buffalo to Milwaukee, net ton	41.38	35.00	30.00
Hard coal, Buffalo to Chicago, net ton	40.85	35.00	30.00
Hard coal, Buffalo to Duluth, net ton	31.50	30.00	30.00
Lumber, head of the lakes to Ohio ports	234.59	260.00	276.49

Generated on 2024-07-25 21:57 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

Heavy Duty Gasoline Engine

Alexander Winton Has Just Put on the Market an Internal Combustion Engine Designed for Commercial Use

ALEXANDER WINTON, pioneer builder of motor cars, has organized the Winton Gas Engine & Mfg. Co., Cleveland, to engage in the manufacture of large internal combustion engines, designed primarily for commercial boats, but which will probably also appeal to yacht owners, owing to their exceptionally quiet operation. A partial description of this engine with sectional drawing was published in the November, 1912, MARINE REVIEW, but it is now possible to supplement it further together with a description of the manufacturing plant, which has practically been completed since that time.



THE WINTON 200-H. P. SIX-CYLINDER MARINE GAS ENGINE

The company has built a modern factory of brick and steel construction, 300 ft. long and 80 ft. wide, the interior of which is commanded by a 15-ton electric crane, traveling the full length of the structure, and a switch in one end of the building permits the loading of cars directly from the floor. The plat of ground upon which the plant is located is ten acres in extent, allowing ample room for future expansion.

The company has at present in course of erection on the floor six 200-H. P. engines. The total weight of the engine is a little over 8 tons, developing 200 H. P. at 400 R. P. M. It runs as quietly as a watch. The engine is a beautiful piece of workmanship throughout and is a delight to see in operation, one of them having been running a generating set in the plant for months. The engine, a six-cylinder, is eminently suitable for tugs, harbor ferries and fishing boats.

The cylinder and cases are of special formula gray iron, known as cylinder iron, very hard. Piston and rings are of the same material and all moving parts have ground finishes. The connecting rods are all drop forgings of the I-beam section. The crank shafts are of vanadium steel. The gears and pinions in the reverse gear are forged integral with the shafts and flanges, machined out of the billet and are of chrome-vanadium steel. There is not a single cast iron gear in the construction of the whole engine. Even the cam shaft drive is made up of spiral worm gears of hardened tool steel and the only spur gears in the construction of any of the models are used in the reverse gear. This construction in connection with the design of the engine, which houses entirely the working parts, including the flywheel, is responsible for its exceptionally quiet operation.

The design, while in keeping with general engineering practice, is unique in many ways and shows the results of Mr. Winton's long experience in internal combustion engines. The cylinders are cast in pairs with detachable heads, the manifolds are cast integral with the cylinders, which, therefore, eliminate the numerous gaskets and possible leaks which are bound to become evident where manifolds are detachable.

The valves have machined steel stems and nickel steel heads with unusually large stems, and the stem guides are arranged so that these valve stems at all times are lubricated. The valve lifters are adjustable so that there is never any occasion for this engine to become noisy, as the slightest wear can be taken up. The valve lifters are of the usual type operating in a bronze

INTERIOR VIEW OF THE NEW WINTON PLANT DESIGNED EXCLUSIVELY FOR MANUFACTURE OF HEAVY DUTY MARINE GAS ENGINES

Generated on 2024-07-25 21:57 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

sleeve and are fitted on the bottom with hardened steel rollers riding on hardened steel cams. The valve stems and lifters are entirely housed in, yet are easily accessible through man-hole covering plates. The cam shaft is unusually large and is carried on four main bearings, all interchangeable, and all of the very best grade of bronze. This shaft may be removed from the front end of the machine without disturbing any other part. The pistons are of the usual type with three rings above the piston pin, and the piston pin is hollow and held fast in the connecting rod, taking its bearings on two bronze bushings in the piston. The connecting rod is of the usual type and the lower bearing cap is held in place by four nickel steel bolts, the bearing metal being of the very highest grade, known as Parson's white brass. These bearings are unusually large and removable.

The flywheel is located between the reverse gear and the engine, where it is bolted to the crankshaft and to the reverse gear in such a manner as to make it possible to remove it or to take apart this end of the engine without the usual difficulties experienced with most marine engines now on the market.

The cooling or water circulation is interesting. This is accomplished by a centrifugal pump driven through spiral gears off the forward end of the crank shaft. By method of by-passing and regulating the volume of the throw of water to each individual cylinder, a perfect uniform temperature at the bottom as well as at the top of the cylinder is at all times assured.

The oiling system has been given much attention. It is known as a constant pressure system and feeds by pressure to every working part of the engine. It is actuated by a single gear pump receiving its oil from a reservoir in the bottom of the engine.

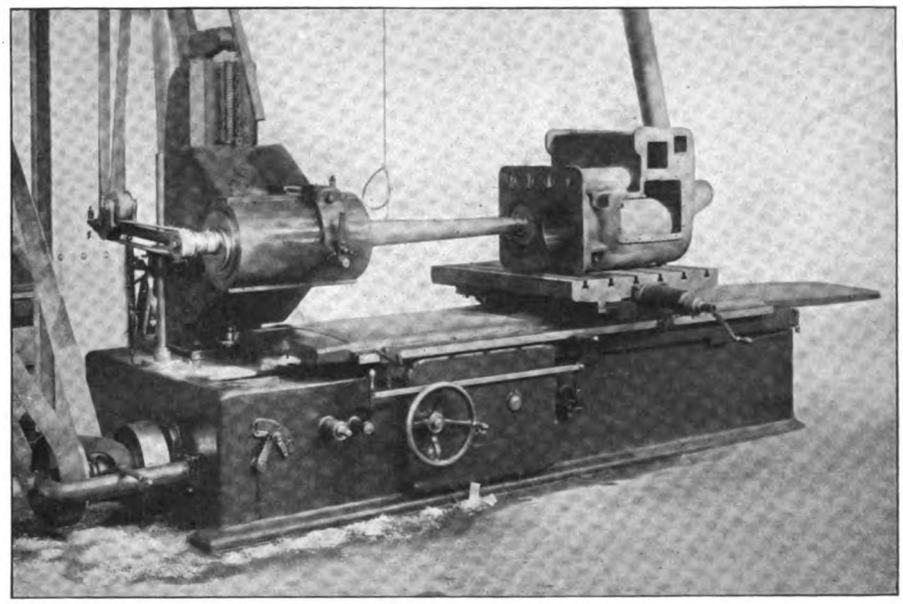
The surplus drains back into the reservoir, where it is filtered and circulated through the system again.

The ignition apparatus is furnished by the Bosch company and is known as their low tension make-and-break plug system, which is not affected by dampness and is conceded to be the ideal ignition system for large motors. Each engine is furnished with two magnetos which are located on the front end of the machine and driven through a spiral gear operated jack shaft.

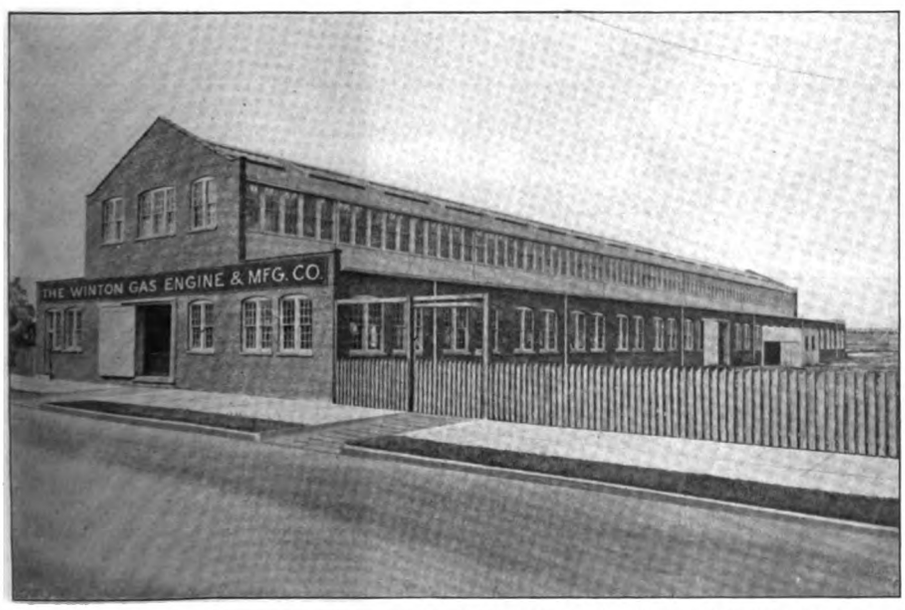
These engines are furnished with Schebler carburetors and the control is perfect. The engine is fitted with a governor which prevents racing when the propeller gets out of the water.

While the company has only recently put this engine on the market, a number of the motors have been in use from one to three years, operating direct-connected lighting plants and in marine service. The largest motor yacht in this country, the La Belle, is equipped with 450 H. P., and a still larger vessel is to be equipped this year.

Reverting to the plant, the machine tool equipment, which is installed in one wing down the full length of one side of the building, is new and of the very latest pattern and is probably the largest equipment of its kind used in the manufacture of internal combustion engines for marine purposes. The screw machines were furnished by Warner & Swasey, Cleveland, the spiral hobbing machines by Eberhardt Mfg. Co., Bristol, Conn., grinders and millers for standard work by Brown & Sharpe, Hartford, Conn., and the four big radials by the American Tool Co., of Cincinnati. The cylinder grinder is a special machine, as there is no standard machine on the market which will grind the large cylinders such as used in the product of this company, and this grinder was designed and built in the company's own plant, and has a capacity for cylinders up to 24 in. of bore and 48 in. of stroke. Just as unique as the cylinder grinder is the cam grinder for grinding cams for these very large machines. This is also a type of machine which is not found on the market and it was necessary to design and build it. The sole object of these machines is the absolute accuracy which the Winton company believe is necessary on large internal combustion engines.



MACHINE BUILT SPECIALLY FOR GRINDING LARGE CYLINDERS



EXTERIOR VIEW OF THE NEW WINTON PLANT DESIGNED EXCLUSIVELY FOR THE MANUFACTURE OF HEAVY DUTY GAS ENGINES

Generated on 2024-07-25 21:57 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

Subdivision of Ships*

Dr. J. Bruhn, Director of the Norske Veritas, Discusses This Most Important Element in Ship Construction

A PAPER on this subject is interesting at any time, but when the writer is an authority like Dr. Bruhn, and at a time like the present, while the ship building and ship owning world is so full of speculation as to the findings of the Bulkheads Committee, it becomes of paramount importance.

Exceptional Accident

Dr. Bruhn opens by warning us not to consider the exceptional accident to the Titanic as a standard, in the sense that sufficient subdivision ought now necessarily to be demanded to enable a ship to float with as extensive damage as she received. It is, indeed, possible to imagine an accident of such a nature that no practicable subdivision would prevent a vessel from foundering. In this he has undoubtedly the consensus of professional opinion with him.

Dr. Bruhn treats the subject by considering the usual principal causes of injuries to ships which may affect their flotability, and the practicable means of reducing and confining the damage so caused. The principal causes are:—(1) Contact with the bottom of the sea; (2) contact with rocks extending above the level of the bilge; (3) collision between two ships; (4) contact with derelicts; (5) contact with ice; (6) torpedo explosions.

Bottom Damage

No damage to the bottom of a ship is likely to extend very far into the vessel. Double bottoms, when fitted to merchant vessels, are generally for the purpose of carrying water ballast, and not for safety. These are of greater depth than would be necessary for this purpose. So that no increase in the depth should be required. As regards compulsory fitting of double bottoms, this should be the case in all passenger vessels over 200 ft. in length.

Extent of Inner Bottom

The bilge is subject to almost all the injuries that a ship's hull may receive, and on this account the inner bottom ought, in all large ships, to extend over the full breadth of the vessel, and also in passenger ships of, say, over 600 ft. in length, to be extended up the bilge to a height above the keel of about 20 per cent of the molded depth.

Dr. Bruhn is of the opinion that the injuries caused by collision extend so deeply into the vessel that another skin fitted a short distance inside the outer is of comparatively little use.

Injuries caused by rocks, derelicts and ice may be supposed to be confined to the forward part of a vessel.

*Condensed from a paper read before the Institution of Engineers and Ship Builders, Scotland.

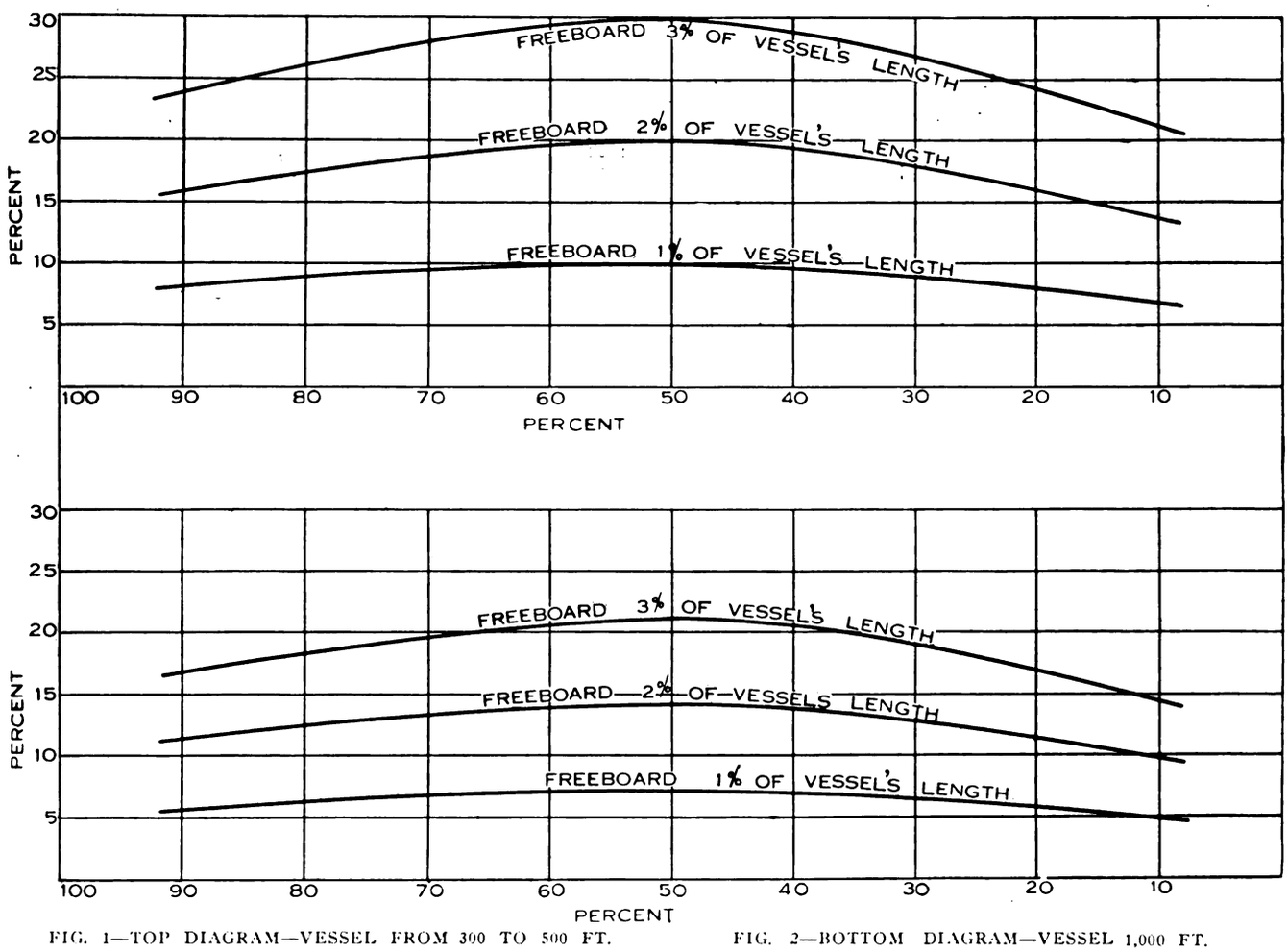


FIG. 1—TOP DIAGRAM—VESSEL FROM 300 TO 500 FT.

FIG. 2—BOTTOM DIAGRAM—VESSEL 1,000 FT.

Generated on 2024-07-25 21:57 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

WARNING!

"Cheap" Graphite not only Dangerous but also Expensive

The use of Graphite as a boiler scale remedy is a matter in which, naturally, we are much interested, and for that reason have closely investigated. Our research has extended over a period of several years and has been very thorough. We, ourselves, have made numberless experiments in our own boilers and we have observed its action in hundreds of other plants. A number of the best commercial laboratories in this country have tested it in every possible manner. The verdict of all is that PURE Graphite of a certain kind, prepared and used in a certain way, is the surest, safest, and least expensive of all boiler scale remedies.

But it must be PURE, ground to an unusual degree of fineness, and physically suited to the purpose.

U S G CO.'S MEXICAN BOILER GRAPHITE possesses all these requirements and this fact coupled with our reputation for square dealing brought it quickly to the front and it today stands as the ORIGINAL BOILER GRAPHITE.

And now, following the remarkable successes which have attended the use of this Graphite come innumerable and unscrupulous imitators, offering to the uninformed consumer fake "boiler" graphites, so heavily loaded with damaging adulterants as to render their use in boilers an absolute menace to the safety of the plant.

For instance, one of these imitators is offering Boiler Graphite at a PER POUND price slightly under our own—just enough to tempt the unwary—but the cost PER BARREL (which is really what counts, for both their directions and our own call for equal dry measure per 100 H. P. developed) considerably exceeds that of ours because their barrel weighs 500 pounds and ours but 400 pounds.

Now you say—why this difference in weight, why should one barrel of Graphite weigh more than another? The answer is the difference in purity and the difference in the degree of pulverization. It means that this excess weight is due to the presence of heavy adulterants, which, instead of loosening scale, materially aids in its formation. It means, too, that the stuff is not so finely ground as it should be in order to remain in suspension and circulate freely with the water throughout the boiler.

Be on the safe side and use the Boiler Graphite with a record and a reputation—the one that has made good—U S G CO.'S MEXICAN BOILER GRAPHITE prepared from carefully selected ore, by the United States Graphite Company, who own and operate their own mines near Torres, Sonora, Mexico, and are the world's largest producers of Graphite of the sort suitable for use in steam boilers.

Do not jeopardize the safety of your boilers by abusing them with coarsely ground, impure and heavy "Graphite", prepared by a concern dependent for its supply upon uncertain importations of ore coming from sources so numerous as to make even reasonable uniformity absolutely impossible and who perchance do not even grind their own product.

Use The Original Boiler Graphite

The United States Graphite Co.
GRINDERS OF GRAPHITE FOUNDRY FACINGS
MINES NEAR TORRES, SONORA, MEXICO
U.S.G.Co's Mexican Boiler Graphite
Saginaw, Mich. U.S.A.

U S G Co.'s Mexican Boiler Graphite

Introduced into the boiler feed our Graphite works through and beneath all-ready formed scale and loosens it so that it either sloughs off or may be easily removed. Then by mingling with the scale-making element present to some extent in all feed waters, it keeps the formation soft and easily removable—sometimes entirely arrests the development of scale.

U S G CO.'S MEXICAN BOILER GRAPHITE does this work by MECHANICAL action. It has no chemical effect, cannot cause "foaming", nor under normal conditions, will it carry out with the steam.

Moreover, for this same reason, that is because it acts MECHANICALLY, U S G CO.'S MEXICAN BOILER GRAPHITE is effective in ANY feed water regardless of its character—in YOUR feed water—thereby saving the trouble and expense of frequent water analyses.

Put up in barrels (about 400 pounds) and in 100-pound drums.

Our booklet H goes into this subject thoroughly and is yours free for the asking. Write for it. Ask for testimonials. See who is using it. Do it TODAY

THE UNITED STATES GRAPHITE CO.,

Miners of Graphite and Manufacturers of Graphite Products.

SAGINAW U. S. A. MICHIGAN

Generated on 2024-07-25 21:57 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

For end-on impact the collision bulkhead is quite satisfactory, and should be fitted a distance of from 5 to 10 per cent of the vessel's length from the stem.

Impacts that take place clear of the stem will not as a rule extend very far into a vessel, but on account of first cost, upkeep and reduction of hold capacity, an inner skin ought not to be made compulsory except in the largest passenger vessels, say, over 700 ft. in length. This should extend to some distance above the water line, and for a length of about 30 per cent of the length of the vessel abaft the collision bulkhead.

Bilging Calculations

Regarding bulkhead subdivision, Dr. Bruhn places very little faith upon bilging calculations, and thinks that the length of the holds may be just as satisfactorily limited in some arbitrary way, the best method being to specify definitely the maximum length of holds permissible in any particular vessel, with due regard to dimensions and freeboard, and avoid the question as to what are safe conditions and assumptions. It is not very evident here what he means. Whatever way the question is tackled some standard must be adopted upon which to base the recommendations, and in setting up such a standard assumptions have necessarily to be made. Of course, as he points out, the particular conditions under which the 1890 committee state that a vessel must be considered able to float are open to criticism. They assumed a freeboard of only 3 per cent of the molded depth, which they evidently settled upon "with due regard to dimensions, etc"., to use Dr. Bruhn's own words.

On account of the small number of passengers carried on a cargo steamer, and the life-saving appliances that are carried, no more additional subdivision is recommended.

As regards passenger steamers, for similar reasons there is no call for any improvements in the smaller vessels up to about 250 ft. For vessels from 250 to 300 ft. one or two bulkheads should be fitted between the machinery space and the holds. For vessels of 300 ft. and over, he recommends the use of curves, as shown. These give the maximum length of holds permissible in percentages of the length of the vessel and for the various distances of the centers of the holds from the stern. Freeboard is measured to the bulkhead deck, and intermediate values may be obtained by interpolation. Lengths between 500 ft. and 1,000 ft. are also dealt with by interpolating. These curves must be used as follows:

For vessels between 300 ft. and 350 ft. the length of holds from amidships to the fore peak is not to be less than indicated by Fig. 1, and if the engines are amidships there is to be at least one bulkhead fitted between the after peak and the machinery space.

For vessels between 350 ft. and 400 ft. the length of each of the holds between the peaks is to be as shown by Fig. 4.

For vessels between 400 ft. and 500 ft. the combined length of any two of the holds from amidships to the forepeak, and the length of any one of the remaining holds, is to be as indicated by Fig. 1.

For vessels over 500 ft. the combined lengths of any two holds between the fore and after peaks should not be less than indicated by Figs. 1 and 2.

These limits are selected arbitrarily, and are put forward as a basis for adopting the proposed rules. Any damage that may affect more than two holds can only be satisfactorily dealt with by providing an inner skin.

As Dr. Bruhn points out, it is very inconvenient to be tied to a certain length of hold, and if the bulkheads are carried up high an allowance should be made for this. This would no doubt cause some inconvenience to the passenger space, but the safety of vessels as now built cannot be materially increased without causing some inconvenience to passengers or designers. By the use of curves such as he suggests it is possible to make both take a share in bearing the burden.

Stability of Ship

No official regulations regarding the stability of the ship when flooded are recommended.

Regarding longitudinal bulkheads, these should not be made compulsory on account of the danger of capsizing if a side compartment is bilged. If they are fitted they should be carried up to a good height.

Watertight flats are only recommended for very large vessels, and should be confined to the space between the collision bulkhead and the foremost boiler room bulkhead, at a good distance above the waterline, having watertight trunks to the height of the bulkhead deck.

Speaking on the question of life-saving appliances, Dr. Bruhn is of the opinion that the 1890 committee were wrong in suggesting that no part of the usual additional boats, rafts, etc., required by the board of trade might be omitted where the bulkheads were fitted in accordance with the rules recommended by that committee. Subdivision ought to be made compulsory, independent of life-saving appliances. But as the size of vessels increases, a relatively smaller proportion of the total life-saving appliances could reasonably be formed of ordinary boats, especially as collapsible boats, rafts, etc., become relatively more efficient than ordinary boats, when the size of the vessel gets larger and the chance of a boat reaching the water safely in rough weather gets less.

The paper should give rise to a good deal of discussion, and it will be exceedingly interesting to compare the findings of the committee with Dr. Bruhn's recommendations. They represent a distinct advance on present practice, and at the same time possess the great advantage of not being revolutionary in character.

Hardy Bill Passed

The Hardy bill passed the senate in its closing days and is now a law. This bill requires ocean-going vessels of 1,000 tons to carry three licensed mates, who shall stand in three watches. If their run, however, is less than 400 miles, two mates will suffice. Lake carriers are excluded from this provision. The bill also contains the following provisions:

"That nothing in this section shall be construed as to prevent local inspectors from increasing the number of licensed officers, on any vessel subject to the inspection laws of the United States, if in their judgment such vessel is not sufficiently manned for her safe navigation; Provided, that this section shall not apply to fishing or whaling vessels, yachts or motor boats as defined in the act of June 9, 1910.

"That it shall be unlawful for the master, owner, agent or other person having authority to permit an officer of any vessel to take charge of the deck watch of the vessel upon leaving or immediately after leaving port, unless such officer shall have had at least six hours off duty within the 12 hours immediately preceding the time of sailing, and no licensed officer on any ocean or coastwise vessel shall be required to do duty to exceed nine hours of any 24 while in port, including the date of arrival, or more than 12 hours of any 24 at sea, except in case of emergency, when life or property is endangered."

Generated on 2024-07-25 21:57 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

Marine Repairs

"Thermit" Weld on Rudder Post.

The Thermit Welding Process is quick, easy, and effective—and when applied to broken rudderframes, sternposts, or sternframes, will enable your vessel to return to service in two or three days, effecting a tremendous saving in dry dock charges.

There is nothing experimental about Thermit Welding. During the last few years we have executed many repairs for the principal steamship companies of the Atlantic and Pacific coasts and the Great Lakes and every repair has been uniformly successful and our best advertisement.

Our process is sanctioned by the British Corporation for the Survey and Registry of Shipping, Glasgow.

If you are interested obtain our phamphlet No. 2540 and Reactions, which illustrate and describe many marine repairs and contain full information about the process. Every marine man should have one.

GOLDSCHMIDT THERMIT COMPANY
WILLIAM C. CUNTZ, Gen. Mgr.
90 West Street, New York
432-436 Folsom St., San Francisco 7300 So. Chicago Ave., Chicago
103 Richmond St., W., Toronto, Ont.

The Babcock & Wilcox Co.

NEW YORK and LONDON

Forged Steel

Marine Water-Tube Boilers

and

Superheaters

for

Naval Vessels **Merchant Steamers**
Ferry Boats **Yachts and Dredges**

These boilers hold the record for economy, capacity and endurance in the Navies of the World.

They have shown the same characteristics in the Merchant Marine. Babcock & Wilcox Boilers and Superheaters in one vessel are *saving more than 15 per cent.* over Scotch boilers in sister vessels.

Is a reduction in your coal bill of any interest to you?

Babcock & Wilcox Boilers have all essential parts heavier than corresponding parts in Scotch boilers, giving greater security against corrosion. They are lighter, safer, easier to clean and to operate than Scotch boilers, and much more efficient.

We are constantly receiving "repeat orders" from owners of merchant vessels who have had many years' satisfaction from the earlier installations.

Write us for details

OAKUM

W. O. D. & S.

On a Bale of Oakum

INSURES QUALITY

Grades—Best, U. S. Navy, and Navy, both Spun and Unspun.

Also Plumbers' Oakum and Spun Cotton.

Give us an opportunity to show you the quality of our goods.

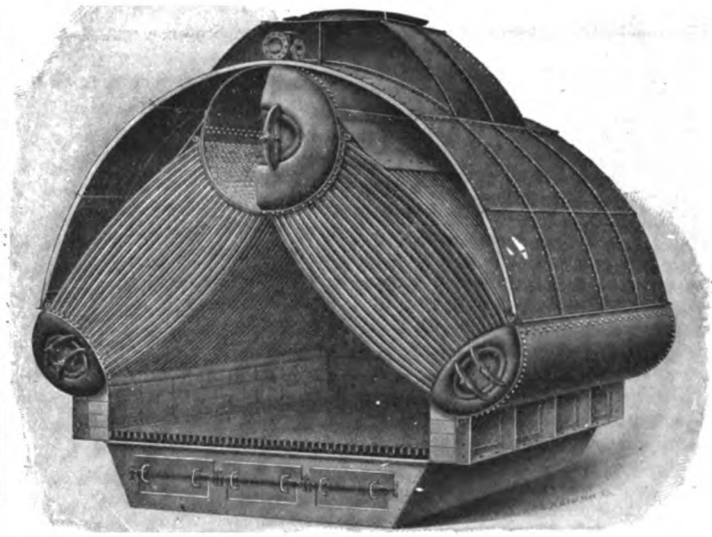
We were established in 1840, and for over 70 years have been doing a business that has been made possible only by "Square Dealing".

"Quality, First, Last, Always"
IS OUR MOTTO

Let us hear from you at once.

W. O. DAVEY & SONS
JERSEY CITY, N. J.

Mosher Water Tube Boilers



Adapted for the highest grade service, Torpedo Boats, Destroyers, Battleships, and large commercial vessels. Steam drums up to six feet in diameter, larger water and steam room capacity than any other boiler.

Any tube can be replaced without disturbing any others. Fifty tubes removed through one hand-hole. Curvature of tubes just sufficient to avoid expansion troubles. Greatest facility for cleaning interior and exterior of tubes. No screwed joints, all tubes expanded. All parts of wrought steel. Send for catalogue.

MOSHER WATER TUBE BOILER CO.
30 Church Street, NEW YORK

Generated on 2024-07-25 21:58 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY

Gilchrist Fleet Sold at Auction

The vessels of the Gilchrist Transportation Co.'s fleet were offered for sale at public auction in the Federal building at Cleveland on Thursday morning, March 6, pursuant to an order of the district court. S. P. Shane, receiver, acted as auctioneer. There were more vessel owners and masters assembled in the court room than have ever been brought together as a single body in Cleveland. Practically every prominent vessel owner along the lakes was present in person or was represented by an agent. The vessels were offered in fleets. The auctioneer announced that no bid for less than two-thirds of the appraised value would be entertained.

The first fleet consisted of the steel steamers, F. W. Gilchrist, J. L. Weeks, P. J. Walker, J. C. Gilchrist, R. C. Schuck, R. L. Ireland, H. S. Sill and L. Woodruff. These vessels were appraised at $205,000 each, aggregating $1,640,000. H. P. McIntosh, of the Guardian Savings & Trust Co. as trustee under mortgage bid $1,093,334 for the fleet. The mortgage on this fleet amounts to $500,000. The vessels were then offered singly, but there were no bids.

Fleet No. 2, consisting of the steel steamers, F. J. Hecker and George H. Russel, each appraised at $220,000, a total of $440,000, were then offered. Mr. McIntosh, as trustee, bid $293,344. Charles L. Hutchinson, of Cleveland, ran up the bid to $302,000, but did not increase Mr. McIntosh's offer of $302,500. When these vessels were offered singly, Capt. Hutchinson bid $155,000 for the Hecker, which Mr. McIntosh increased to $156,000. Mr. McIntosh also put in a bid of $146,667 for the Russel. There were no other single bids. The mortgage on this fleet is $108,000.

Fleet No. 3, consisting of the steel steamers, J. B. Wood and John Sherwin, each appraised at $274,000, a total of $548,000, were then offered. Mr. McIntosh, as trustee, bid $365,334, which was instantly raised to $375,000 by J. E. Chamberlain, of Chicago. The bidding followed rapidly, Capt. Charles L. Hutchinson increasing the amount to $415,000, but then dropping out. The contest continued between Chamberlain and McIntosh. Mr. Chamberlain dropped out at $441,000, Mr. McIntosh's bid being $442,000. Mr. Chamberlain then bid $222,000 for the Sherwin, which Mr. McIntosh increased to $223,000. H. R. Oakes then ran the price up to $226,000, but Mr. McIntosh promptly bid $230,000. There were no single bids for the steamer, J. B. Wood. The mortgage on this fleet is $180,000.

For Fleet No. 4, consisting of the steel steamer, J. C. Gilchrist, appraised at $158,000, Mr. McIntosh bid $105,334, the mortgage being $30,000.

For Fleet No. 6, consisting of the steel steamer, Lake Shore, appraised at the same figure, he also bid $105,334, the mortgage being $30,000.

For Fleet No. 7, consisting of the steel steamers, Jupiter, Venus and Neptune, each appraised at $157,000, a total of $471,000, Mr. McIntosh bid $314,000. There were no single bids on these three steamers. The mortgage on this fleet is $210,000.

For Fleet No. 8, consisting of the steel steamers, F. W. Hart, F. M. Osborne, E. N. Saunders, Steel King and C. W. Watson, each appraised at $175,000, a total of $875,000, Mr. McIntosh bid $584,000. There were no single bids for these steamers. The mortgage on this fleet is $200,000.

For Fleet No. 9, consisting of the steel steamers, E. W. Oglebay, appraised at $108,000, Merida at $96,000, and D. M. Whitney at $190,000, a total of $394,000, Mr. Shane was unable to procure a bid as a fleet. There were no single bids for the Oglebay and Whitney, but Frank Sullivan, of Cleveland, bid $64,000 for the Merida. Roy Wolvin, of Duluth, bid $65,000, but did not increase Mr. Sullivan's bid of $65,500. This was the only vessel sold that did not go to the bank.

For Fleet No. 10, consisting of the steel steamer, Thomas Maytham and barge Tyrone, no bids were submitted.

Nor were there any bids for the wooden vessels, consisting of the steamers, G. F. Williams, Mecosta, Volunteer, Neosho, Tacoma, Wallula and Colonial, though their appraised value was very low, ranging from $1,000 to $3,000.

These bids will be reported to the court by the receiver.

The hazard of lake vessel owning, particularly without trade connections, is well exemplified in this sale. There will be nothing left whatever for the stockholders. The 23 steel steamers that were sold brought $3,012,002—a trifle more than two-thirds of their appraised value, an amount insufficient to satisfy the bondholders and creditors. All of the vessels, with one exception, were bid in by the creditors' committee represented by H. P. McIntosh, of the Guardian Savings & Trust Co. There are $1,479,000 in bonds outstanding, $200,000 in receiver's certificates, $1,146,000 in notes to a number of Cleveland banks and the American Ship Building Co., and $566,000 in a note to the American Ship Building Co. This leaves an obligation estimated at about $550,000 including current charges unprovided for, against which there are four steel steamers and several wooden boats still unsold. No bids as noted were received for these four steamers or for the wooden boats at the auction, but they may be disposed of in private sale within a few days. James Mitchell, formerly fleet engineer of the Gilchrist Transportation Co., purchased the wooden steamers City of Rome, C. C. Hand and Vermillion at private sale during the present week, and it is likely that others of the wooden boats will be sold before the week is out.

The 22 steamers purchased by Mr. McIntosh will be placed in condition at once to go into commission at the opening of navigation and will probably be managed by one of the leading vessel firms if a new merger is not formed meanwhile.

The United States government has recently purchased from the Safety Car Heating & Lighting Co., 43 Pintsch beacons for use in St. Mary's river. These beacons will use high pressure Pintsch gas and 6 ft. high pressure Pintsch gas flasks. They will also use 300 mm. Pintsch mantle lanterns. The government has also purchased from the company five range lights for use in the Detroit river.

The Great Lakes Dredge & Dock Co., which has the contract for rebuilding the Lehigh Valley ore docks at Tifft Farm, Buffalo, will begin operations during the present week. The contractors will rebuild 600 ft. of the ore dock and will deepen the channel in the Blackwell canal to a depth of 23 ft.

L. W. Ferdinand & Co., 201 South street, Boston, Mass., have just issued a few pointers in regard to applying Jeffery's marine glue to the seams of decks. If the instructions are followed as they should be, no trouble whatever will be experienced with this glue, which is very tenacious.

The Portland Co., Portland, Me., has been awarded contract by the Macombie-Nickerson Co., Providence, R. I., for a fishing steamer 142 ft. long, 22 ft. beam and 10 ft. deep. The hull will be built by Robert Palmer & Sons, Noark, Conn.

The H. W. Johns-Manville Co. announce the removal of their Newark office to 239 Halsey street.

FOR SALE: — ONE TUG BOAT AND derrick scow. For particulars address Coast and Interior Contracting Co., Fayetteville, N. Y.

Generated on 2024-07-25 21:58 GMT / https://hdl.handle.net/2027/nyp.33433109936298
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from NEW YORK PUBLIC LIBRARY